A case study of the use of computer conferencing at the Open University

Thesis

A Case Study of the Use of Computer Conferencing at the Open University

ROBIN D. MASON

BA (Toronto), MA (Wisconsin)

Thesis submitted for the degree of Doctor of Philosophy
in Educational Technology

December 1989

PAGINATED
BLANK PAGES
ARE SCANNED AS
FOUND IN
ORIGINAL
THESIS

NO
INFORMATION
MISSING

EKa Christine

EX12

HIGHER DEGREES OFFICE

LIBRARY AUTHORISATION FORM

STUDENT: Robin Mason SERIAL NO: M 7024843

DEGREE: Doctor of Philosophy

TITLE OF THESIS: A Case Study of the Use of Computer Conferencing at the Open University

I confirm that I am willing that my thesis be made available to readers and maybe photocopied, subject to the discretion of the Librarian.

SIGNED: Robin Mason DATE: Dec 11/89

ABSTRACT

A Case Study of the Use of Computer Conferencing at the Open University

This case study is set within the theoretical framework of distance education, and is centred on the first large-scale use of computer conferencing for distance education at the Open University. The concepts of independence and autonomy, of the quasi-industrialisation of large distance teaching universities, and of interaction with learners, are taken as the frameworks for analysing the success of this application of the medium. The hypothesis concerning the convergence of traditional and distance education systems is given further support by the introduction of this new technology.

The perspectives of the students who used conferencing as part of their course on Information Technology, the tutors who used conferencing for tutoring the course, and the course team who designed and wrote the course, and then maintained it with conferencing, are the central areas of investigation and analysis in this study. Qualitative data - from interviews, observation and conference content, is used along with quantitative data from user-generated statistics, from surveys and from the course database.

The success of the application is analysed in three ways: its effectiveness as a mass distance teaching medium, its value as a medium for tutoring, and its use as a minor component of a multi-media course.

The results show that computer conferencing can be used with large numbers of students mastering the system at a distance, though not necessarily using it interactively. The medium is very successful for certain tutoring duties - support, advice and information exchange, and potentially for interactive discussion. However, as a minor component of a course, it is too powerful and too time consuming to be successful.

To Tony Kaye

I would like to acknowledge the encouragement and advice of my supervisors: Diana Laurillard and Linda Harasim, and I am especially grateful to John Mason, my husband, for formatting all the figures and tables.

CONTENTS

Figures

Tables

CHAPTER ONE: THEORETICAL FRAMEWORK

INTRODUCTION

This chapter aims to set out the theoretical framework for a case study on the use of telecommunications in mass distance education. Three different theories about distance education are outlined first of all, and then contrasted with the 'convergence hypothesis'. Each of these theories is analysed according to its relevance to this thesis. The relation between distance education and telecommunications is then introduced and one commonly accepted set of distance education descriptors is used to examine the potential of computer conferencing. Finally, the relation between telecommunications and the convergence hypothesis is examined. A brief overview of the issues involved in defining the field of distance education begins the discussion.

The variety of distance education frameworks in use worldwide has caused considerable argument amongst theoreticians who attempt to define and describe boundaries to the field. Indeed, some proponents of a 'continuum' position claim that there is no definable field of distance education separate from that of education generally (for example, Tight, 1988; Kaye, 1988). Recently, the concept of 'open learning' has further complicated the issue by indicating a growing convergence between distance education and the mainstream in teaching-learning systems (Hodgson *et al.*, 1987; Smith & Kelly, 1987). Mackenzie *et al.* observed in 1975 that "open learning is an imprecise phrase to which a range of meanings can be, and is, attached. It eludes definition" (p 15). Considerable effort, however, continues to be expended on the view that the term 'distance education' can be applied to a circumscribed field (Keegan, 1986 and 1988), though the definition of its boundaries is more contentious.

One of the most critical boundaries is drawn by the choice of terminology for the field. 'Distance education' is a generic term and is commonly used in Britain. Correspondence education is, however, a term used in many other parts of the world. Then there are country-specific terms: independent study in the USA, external studies in Australia, télé-enseignement in France, Fernstudium in Germany and so on. Finally, there are related terms which have slightly different connotations: open learning, out-reach, off-campus programmes and independent learning. After some debate (Moore, 1977; Holmberg, 1980; Keegan, 1980), the term 'distance education' seems to have been choosen as the most suitable term for the field and is now used very widely.

Although choosing a term has brought some clarity to the area, the wide variety of educational methods and practices which are used world-wide has led to difficulties of classification. Practices as dissimilar as rural radio schools with students forming a listening circle, straight correspondence tuition, multi-media institutions and now electronic universities are all considered distance teaching institutions. Even if the discussion is limited only to the higher degree granting institutions, there are still over 10 million students involved and over 500 institutions throughout the world. Kaye (1988), for instance, details the variations in institutions world-wide from the 2.5 million distance students in the USSR and China, to the newest organisations in the Netherlands, India and Japan.

A number of attempts have been made to categorize the wide range of universities which teach at a distance. Peters' simple classification (quoted in Rumble and Harry, 1982) divided institutions into western and eastern models, the former based on printed materials plus written or mediated communication, and the latter based on printed materials plus face-to-face meetings. Other typologies categorise institutions by degree of autonomy, by method of administration, finance and structure. Most, however, clearly

distinguish the autonomous institutions which teach only distance students (El-Bushra, 1973; Neil, 1981; Keegan and Rumble, 1982). As this thesis concerns such an institution, the further intricacies of these various typologies are not a concern. The classification used by Harry (Harry and Raggatt, 1984, and described in Kaye, 1988) of the United Nations University/International Centre for Distance Learning in compiling a database of distance education programmes is most useful for the purposes of this thesis:

Type A - those set up exclusively to provide distance education courses, the numerous 'open universities'

Type B - conventional institutions with distance teaching or external study departments, the dual-mode institutions common in Australia, India, China, the USA and Zambia

Type C - conventional institutions with some distance-teaching programmes, but without a special distance-teaching department.

Although theories of distance education are obliged to account for the practices of all three types of institutions, the discussion in this thesis will be limited to their application to type A universities, and specifically to the British Open University.

THEORIES OF DISTANCE EDUCATION

The notion of a theory can mean something as precise as a proposition which is refutable, or something as broad as a general statement which describes phenomena. While theories of the former kind can be very powerful, descriptive theories of the latter sort have their value in areas which do not lend themselves to formulation by proposition. Perraton (1987) and Holmberg (1988) have both attempted to develop theories about distance education which are predictive and falsifiable. However, they are very much in a minority

amongst theorists in the field. On the whole, the nature of theory in educational research is not so much the result of testing hypotheses, as the generalisations which arise in attempting to explain some phenomena. Wiersma (1969) claims that the criterion for judging a theory is not its truth or falsity, but its usefulness - in identifying the crucial issues and factors, and synthesizing them to provide deeper understanding and wider applicability.

Many of the main theoretical frameworks of distance education are really descriptions of practice which give emphasis to particular elements and exclude, downplay or disown other elements. Keegan (1986) very usefully sets out three leading frameworks and the background research of their founders: the first - independence and autonomy, the second - industrialisation, and the third - interaction and communication. By looking at each of the three frameworks in the light, not of their truth or falsity, but of their usefulness, conclusions can be drawn at the end of this thesis about their value in providing a deeper understanding of the particular case study to be presented here and their applicability to the wider potential which it introduces.

Independence and Autonomy

Proponents of this framework, a student-centred approach, highlight the element of student independence and autonomy as the chief feature both in defining the field generally and in distinguishing one particular programme from another. Moore (1973) resists defining distance education in terms of the separation of teacher and learner, by emphasising the result of the separation.

> Learner autonomy is heightened by distance. Indeed, the learner is compelled by distance to assume a degree of autonomy that he might find uncomfortable in other circumstances. Similarly the teacher in a distant situation is compelled to assume the ancillary, supporting,

helper's role, to be used and drawn upon, by the learner, to the extent that the learner desires. (page 670)

Wedemeyer placed his emphasis on the role of the tutor as monitor and motivator of the distant student. He rejects any mechanisation of this role in the form of computer marked assignments or use of media which restrict the student's control and responsibility for the learning process (Wedemeyer, 1971).

A different angle is contributed by the German, Rudolf Delling, who concentrates on the needs of the adult student studying at a distance, not for 'teaching' but for a variety of people, materials and media to support an independent learning programme (Keegan 1986).

Recently, Garrison and Baynton (1987) have extended the independence/autonomy argument by clarifying the terminology. They argue that independence without control - the capacity to assume responsibility for the learning process, and the availability of support resources - is merely "freedom from the influence of others". What is really required in distance education is "a balance between independence and other basic elements (ie power and support) in the learning process through the process of two-way communication between teacher and student" (p 5).

In this framework, therefore, a distance education institution can be classified and anlysed by the extent to which it gives control of the learning process to the student. A system which provides no face-to-face tuition and little student support or counselling would be at one extreme, while a system which offered, for instance, rolling enrollment, project-centred work and a network of student services, would be at the other. This highlighting of the autonomy and independence of the distance learner, whether through the role of the tutor or the supporting institution will prove to be relevant in later discussion of the data. However, although this theoretical framework for distance

education provides an interesting perspective on the practices of various types of institutions, it does not have the breadth to account for many of the issues involved in this case study.

Theory of Industrialisation

The theory of distance education which has roused the greatest controversy is that introduced by Otto Peters in the 1960's. His presentation of the industrial model of distance education, as having profoundly different structural components from conventional education, lies at the opposite extreme to the 'integrationists' who, looking at different examples, see little distinction between traditional university study and distance learning (Keegan, 1986). It is not the purpose of this study to reconcile these views; however, the industrialised model is of such relevance to what follows that it must be described here in some depth.

Peters (1981) draws an historical picture of the conventional university as a relic of pre-industrial days when the artisan was solely responsible for all aspects of his craft. The lecturer researches, designs, and presents material, and inspires and supports the student through direct contact. The development of distance education is linked with the industrialisation of society, both in principle and in practice. Peters presents a detailed heuristic comparison of the processes of industrial production and the processes of preparing and delivering distance teaching material.

Rationalisation Distance education makes efficient use of one expert to deliver high quality teaching material of a constant standard to greater numbers of students than is possible in conventional face-to-face teaching.

Division of labour The various elements of the teaching process are divided in an industrial setting into different areas of specialisation: teaching is separated

from counselling, and from evaluation; writing course material from editing and production.

Mechanisation Unlike the traditional university lecturer using the 'tools' of books, objects and pictures, the post-industrial distance education institution automates some of the production, distribution and evaluation of its teaching in order to cater to the massive demand for higher education places.

Assembly line Peters compares the car moving along an assembly line to the progress of course material through a distance education production process and the subsequent return of assignments from students.

Mass production The economies and rationalisation possible in distance education are based on the mass production of teaching material to meet the 'consumer' demand. Far from reducing quality, this mass production can lead to higher quality teaching and equal opportunity, just as industrial mass production has equalized consumer patterns in town and country and raised the living standard of all.

Planning and preparatory work The analogy between distance education and industrial production is particularly clear in the need for preparatory work, so that the process is not dependent on particular individuals but relies on comprehensive planning carried out during the initial stages.

Standarisation It is obvious that organisation and formal structures are necessary for production on a large scale. Standardisation of teaching material, both content and format are inevitable, as the needs of the majority must prevail.

Change of function and objectification The traditional function of a teacher changes radically in a distance education institute where the division of labour leads to more specialisation and less subjectivity of presentation. Personal

digressions and spontaneous additions tend to be edited out or never enter the polished, group-produced material sent to students.

Concentration and centralisation It makes economic sense to centralise and concentrate the resources of distance education institutes, which has led in many countries to a virtual monopoly by one massive national institution.

What is missing from Peter's analysis is the role of the student, or 'consumer' to use his terminology. However, although the nature and requirements of the student do not figure in his framework, nor the interaction between the tutor and the student, the design and production element of mass distance education institutions is usefully defined by this analogy. It seems obvious from this outline of Peters' theory that it applies most convincingly to a large dedicated distance education institution of the type A category. As this case study concerns an archetypal example of such an institution, this theory is an important framework for the analysis in Chapters Five, Six and Seven.

Interaction and Communication

Keegan's third grouping of distance education theorists consists of those who emphasise the role of the institution in providing an interactive learning environment. Although hardly a new concept, interactive learning has become in the 80's a by-word for all that is desirable in education - almost to the extent of turning 'lecturing' into a pejorative term. Not surprisingly, Keegan finds a good number of theorists in this camp, each of whom adds another dimension to the nature and role of educational communication.

Interaction applied to distance education takes two forms: simulated interactions between the student and the teaching material, and real communications between the student and the tutor or other supporting staff. A major contributor to the former, is Borje Holmberg (1983, 1988), who has established distance teaching materials as a distinctive medium. His theory of

guided didactic conversation is based on the notion of distance learning as self-study, but not private study. With properly developed course materials, the student is involved in a communication process resembling a conversation. This is accomplished by use of a colloquial, readable style, by including advice on what to avoid and what to emphasise, by inviting the student to question or reject views presented, by involving the student emotionally and using a personal style.

Holmberg also underlines the importance of real human interaction in the distance education programme. So many other writers on distance education have contributed to this position that one can only mention a few of them (Baath, 1980, Daniel and Marquis, 1979, Rekkedal, 1985, Sewart, 1978). Baath writes of the use of postal two-way communication, whereby the tutor can play a principal part in linking the new material to the students' previous experience or cognitive structures. Daniel polarizes interaction and independence and seeks to balance the two within the confines of economic reality. Rekkedal has experimented with offering students a tutor who combines the roles of counsellor, administrator and teacher, and finds that this has beneficial effects for the students. Sewart emphasises the need for continuity of support for distance students and the necessity of meeting the infinite variety of their problems with human interaction and support. In terms of this case study, perhaps the most interesting and relevant comment about the value of two-way communication comes from Hilary Perraton (1987) who says that its most important function is :

> to encourage, to correct errors, to signal difficulties on the part of the learner, to inform those who prepare educational materials, and to *allow learner and teacher to take off in directions which had not been forecast.* This last capacity is, for many educators, of unique value and importance, lying at the heart of the educational process if it is to be worthy of the name. (emphasis added)

This element of serendipity and spontaneity in learning, highlighted by Perraton, will be addressed later in the thesis. The nature and extent of communication with students is central to this case study and the theory outlined here provides a substantial base on which to build. However, the activities and concerns of the course developers are not sufficiently highlighted in this framework for it to provide the sole theoretical base for this particular case study.

These three models all attempt to carve out a niche for distance education. Quite the opposite purpose is attempted in the convergence hypothesis: namely, to show that distance education and place-based education[1] are on a converging path.

The Convergence Hypothesis

Although some writers have said that distance education and mainstream education are not essentially different, a new perspective is gaining adherents: that the dividing lines between the two are becoming increasingly blurred. Smith and Kelly (1987) outline a number of ways in which they see this convergence in current educational practice occuring.

Methods They see an evolution in teaching-learning systems which increasingly resemble distance education methods, although some of the features of place-based education are being incorporated. This is particularly so in the choice and use of technical media.

---

[1]This evocative term was apparently first coined by Paul Levinson of Connected Education to refer to traditional campus-based institutions. As the term contrasts well with distance education, it is frequently used in this thesis.

Clientele They discern an intermixing of the traditional clientele served by each of the two types of education systems (for example, towards an older, working student).

Open Learning They predict a movement by both systems towards the principles of open learning. This involves a shift of focus from teaching to learning, and from instructional design to the particularity of individual student response - "less what the institutions provide and more what the learner wants to study, how the learner approaches study and the social and physical conditions which enable study to occur" (Thorpe *et al.*, 1987: 4).

This convergence is moving forward at a faster pace in distance education than in place-based education, which until recently has had little incentive for transformation. Arnold (1988) outlines a number of factors presently affecting higher education in the United States, which are providing just this incentive:

- The traditional college age population is declining absolutely and as a proportion of the population as a whole.
- Ethnic minorities are beginning to constitute a much larger proportion of the college-age population.
- The rapidly rising cost of full-time education leads more students to leave full-time study early and combine continued study with employment.
- Technological changes, such as satellite broadcasting and telecommunications are diminishing the importance of the campus, and changing the role of the faculty.
- Self-paced study, whereby students set their own schedule for learning and monitor their own progress, is increasingly being shown as an effective and productive strategy of instruction.

- Learner-centred approaches are becoming more popular in recognition of the fact that individuals learn in different ways, and need to continue their learning throughout life.

- The growing interest in the principles of self-directed learning is affecting attitudes to learning both for children and adults.

These changes in the educational environment are forcing place-based institutions to adapt, and many are turning to the methods and practices of distance education. The call for 'parity of esteem' (Jevons, 1988), for an end to writing off distance education as second best, or even third rate (Rumble, 1986) is perhaps the first sign that convergence has begun.

Smith (1987) argues that it is new technology, particularly telecommunications, which is the catalyst of the trend towards convergence.

> Technological change, particularly in the area of telecommunications, has the potential to change substantially the way we go about teaching, the way we go about learning, the expectations of teachers and students, and access to education. (p 38)

He points out that the nature of computer-based education - its individualised and interactive qualities - is identical for both campus-based and distance education students. In terms of telecommunications, which might be considered the perrogative of distance education, he cites Cox (1985), who documents uses of electronic communications between place-based institutions.

As the subject of this thesis is a particular application of telecommunications in distance education, it is relevant to look at what the theorists of distance education have to say about the possible impact of electronic communications.

TELECOMMUNICATIONS

Definitions

First, however, it is necessary to define the telecommunications terms to be used in this thesis. The term telecommunication(s), covers any communication via electrical or electromagnetic media - it generally refers to radio, television, telephone and digital systems. Current usage in the microcomputer world tends to confine telecommunications to digital signals exchanged between computers. Teleconferencing is a general term which encompasses a number of technologies, designed to connect individuals or groups, usually in remote locations, to each other electronically. Audio conferencing provides only a voice link; video conferencing provides audio and visual links. Both these technologies require all participants to interact at the same time. With computer conferencing, however, the link is through the written word typed into the terminal and stored on the central computer, where it can be accessed at will by any of the participants at any time.

Computer-mediated communication (CMC) is the set of possibilities which exist when computers and telecommunications networks are used as tools in the communications process - to compose, store, deliver and process communication. Examples of such systems are: remote databases, electronic mail, bulletin boards and computer conferencing. Such systems rely on a basic configuration of a mainframe computer with appropriate software, connected via telephone and data networks to users with terminals or microcomputers.

Online databases

A database is a collection of interrelated data held on files organised so as to allow computer users to manipulate and retrieve data. For groups of widely dispersed users, it is an economical way of making regularly updated

information available for searching, downloading and printing from a remote terminal or microcomputer.

Electronic mail

Kaye (1989) defines the basic unit of electronic mail as a message which is a discrete item of text produced by a sender and addressed to one or more named readers. Most messaging systems include the following features: confirmation of delivery, editing, retrieval, searching and forwarding messages to other users of the system (Harasim, 1986).

Bulletin boards

Electronic mail systems often contain or provide access to a bulletin board, which is a mailbox accessible to the entire community of users. The messages are stored and read linearly, and cannot be grouped by theme or topic. It is thus a rudimentary form of group communication.

Computer conferencing

Harasim (1989a) points out that computer conferencing was developed expressly to facilitate the interactivity of group communication, maintaining an ongoing common transcript of the interactions among the many people discussing a topic. Like databases, electronic mail and bulletin boards, a computer conference is basically a file which consists of participants contributions. However, a conferencing system has more sophisticated facilities for organising and configuring the messages to aid many-to-many communication: for example, storage of all text messages; private notepads for personal files; a directory of members with users' names; the possibility of assigning specialist roles to different participants (moderator, read-only membership, read-write membership); different categories of conference (open, closed, private, unlisted, branching); polling, voting, and multiple-choice

testing; signalling of current online participants with the possibility of simultaneous communication; online text editing; search and retrieval (to access messages by topic, date, name of sender etc); and file transfer from one system to another (Bacsich *et al*, 1986).

Although some conferencing systems offer the possiblity of 'real-time' communication, the basic premise of CMC is that it will be accessed asynchronously. Members need not be active at the same time, but can read and respond at their convenience, 24 hours a day, seven days a week.

Telecommunications and Distance Education

Henri (1988) divides the information technologies into two groups: those involving selective interactivity and those involving full interactivity. The data bases and data banks of the first category, are constantly being enlarged and updated, so that course designers must re-think the role of print and fixed curricula in favour of individual, personalised, self-selected course content. Henri's second group of technologies consists of all forms of computer-mediated communication, where the computer is used merely as a vehicle for the written exchanges amongst users. It is this group of technologies which she sees as most promising for distance education purposes, and with which this case study is concerned.

Kaye (1987a) outlines four of the shortcomings of mass distance education provision, which the introduction of computer-mediated communication could overcome:

- the expense of up-dating and modifying mass-produced print and audio-visual material (by making more material available online)

- the difficulty of introducing innovative teaching methods, when the production and distribution systems are highly standardised and centralised (by the decentralising tendency of online education)

- the relative inflexibility of distance education methods in responding to individual students' needs, interests and experiences

- the limited opportunities for dialogue and group interaction amongst students, and between students and tutors.

Hall (1987) presents a sober view of the potential impact of telecommunications. He acknowledges that the union of telecommunication media like radio and TV with the microchip, the video disc and the microwave dish, is a force which place-based universities will have to acknowledge. The electronic university is not only feasible; it is a reality (Connected Education, for instance). He suggests that the impact of these technologies will be transformatory for distance education students, and significant but not revolutionary for campus-based students. However, he predicts that the true harnessing of the power of new communications technology will require new organisational structures. Hall adds two very significant provisos to the wholesale embracing of telecommunications technology:

- The availability of telecommunications technology does not automatically ensure effective teaching.

- The higher intellectual achievements such as analysis, synthesis, application and judgement, are the goals of truly *higher* education and designers of educational software have usually neglected them.

This latter point has been noted by other researchers and evaluators of telecommunication in education (Feenberg, 1987; McCreary and Van Duren,

1986), and the extent to which these 'higher intellectual goals' are met by telecommunications will certainly be addressed in this thesis.

DESCRIPTORS OF DISTANCE EDUCATION

Despite controversy (Tight, 1988), the defining characteristics of distance education proposed by Keegan in 1980, modified in 1986 and reworded in 1988, continue to be cited as a basic starting point in the development of theoretical principles for the field (for example, Rumble, 1986).

- the separation of teacher and student
- the influence of an educational organisation
- the use of technical media
- the provision of two-way communication
- the quasi-permanent absence of group learning
- participation in the most industrialised form of education
- the privatisation of learning.

Each of these descriptors of distance education (as used in Keegan, 1988) will be analysed and examined in the light of the potential of CMC.[1]

The quasi-permanent separation of teacher and learner throughout the length of the learning process.

The separation in time and place of teachers and learners does not imply that distance education is synonymous with all teaching and learning carried out

---

[1]The following section was originally written as a contribution to Harasim (1989b) *Online Education: Perspectives on a New Medium*. Interestingly, it was written before I read Smith and Kelly, yet I come to a similar conclusion and even use the same term, 'converge'.

over a distance. Distance education should not be the mere delivery, 'at a distance' of classroom-based instruction. A verbatim transcript of a lecture circulated by post to students spread over the country does not constitute distance education by this definition. Information should be designed for a particular medium to best exploit its unique advantages. Although distance learners have more control over when and where studying takes place, they need correspondingly more support in terms of resources they can access in order to carry out the learning process. CMC, as one of these resources, can provide vastly enhanced opportunities for dialogue, debate, and conversational learning. Furthermore, it encourages a sense of community and affiliation through its networking potential (Boyd, 1985), which in turn gives access to other students' experience and opinion. Contributions to a computer conferencing environment come without the visual and status determining cues of face-to-face exchanges. This tends to produce a relatively democratic atmosphere where individual contributions are valued on their own merit. The content of the message becomes the primary focus, which can lead to an ideal situation for developing the tools of critical thinking.

The influence of an educational organisation [rather than a single teacher] *both in the planning and preparation of learning materials and in the provision of student support services.*

The educational institution exists to design and provide learning materials, to enrol and guide students and also to select and review faculty. Small scale organisations usually have a direct link between the design of the course, the delivery of it, and the guidance of the students - in other words, one academic responsible for each course. Large scale organisations usually have many 'interfaces' with students: course teams to develop courses, part-time tutors to interact with students, and regional centres to support students. The danger with the 'massification' of distance education is the pre-packaging of

knowledge; education becomes a product which largely determines what the learning process will be.

It could be argued that CMC is the ideal vehicle for breaking up the educational 'package' and facilitating the processes of internal reflection and re-organisation through dialogue, argument and debate. The part-time tutor can hold continuing tutorials for the duration of the course with a small group of students, encouraging and modeling a deeper engagement with the issues of the course. It allows course material, which is presented over a number of years, to be continuously up-dated and brought to life by current references to daily events. It provides a much faster turnaround time than postal correspondence for communication between student and tutor. As an essentially literary medium, it places a premium on the skills of analysis and written expression in the language of the discipline. These are the key objectives of most post-secondary learning programmes.

Though the benefits of conferencing are most obvious in large scale distance education institutions, many of them apply to small distance learning programmes as well. In fact conferencing offers very exciting possibilities to academics who manage their own course. The potential for interaction and dialogue is one aspect of developing independence in the distance learner; the freedom to negotiate learning objectives and evaluation procedures is another, as noted in the Independence and Autonomy Theory. In order to maintain quality and standards, large educational organisations need to control the curriculum and the examination process. The academic responsible for only a small number of distance students can, through conferencing, offer them the opportunity of diagnosing their own learning needs and formulating their own goals. Thus students have the freedom to choose not only where and when to study, as all distance students can, but also what and how to learn.

The use of technical media: print, audio, video or computer to unite teacher and learner and to carry the content of the course.

The different forms of distance education can be identified by the technical media they choose as the basis for their learning materials. By far the majority of programs are print-based, but a few are audio-based, fewer still video-based and recently, a handful are CMC-based. Many of them are multi-media. On the average British Open University course, for instance, approximately 80% of the student's study time is spent working with text (print) materials, around 10% with audio-visual media (cassettes, broadcasts) and about 10% on interaction with other students and tutors (face-to-face seminars, summer schools, telephone, correspondence).

The role which CMC has taken so far in distance education has varied with the subject matter and the academic level of the students. In seminar-based courses run for small groups of relatively knowledgeable adults, who have a lot of highly relevant personal knowledge and experience to contribute and in many ways are able to provide much of the 'course content' themselves, the time spent in CMC activities is considerable, especially when CMC is used not only for conferencing and electronic mail, but also for accessing publications and data base information. On the other hand, in the CMC-supported external degree program at New York Institute of Technology (where students can opt to use computer conferencing for tutor support rather than correspondence tuition), the proportion of students' time spent in CMC-activities may be as low as 5%-10%.

It is self-evident that for effective learning to occur, the student must consciously interact with, and operate on, the learning material and available resources. There are, of course, many ways to interact - dialogue with other people, whether written or spoken, is but one. While reading, for instance, one can underline and actively extract ideas which impinge on one's own thoughts, or work out answers to problems and self-test questions embedded in the text. While listening to a lecture or watching a video, one can take notes and draw diagrams to represent the overall message. CMC technology and

microcomputers with word-processing software permit other sorts of interaction - the downloading of text messages and documents which can then be edited, modified, and up-loaded again for others to read, comment on and process. These possibilities change the ways in which text material is perceived and apprehended - the authority of a finished, polished product (such as a book) is replaced by something dynamic and modifiable, much more under the learner's control. Perhaps the most important contribution of the new technologies to distance education will be that of the communicating text-processor - that is, an 'intelligent' workstation linked to a CMC system.

CMC is significantly different from the purely 'delivery' media such as print, audio and video. The content of computer conferencing systems is the messages - opinions, ideas and comments - of all the participants.

The provision of two-way communication so that the student may benefit from or even initiate dialogue.

Two-way communication between student and tutor in distance education usually takes the form of written comments on assignments, occasional phone calls or letters, different forms of audio- and video-conferencing, and varying amounts of face-to-face tuition in a group situation. The extent to which students can initiate the communication process varies from one program to another, and this is a significant factor in the development of independence in the learner.

Electronic mail has an obvious advantage over postal correspondence between an individual student and tutor, in terms of increased turnaround time, and flexibility in manipulating text. Computer conferencing vastly increases the opportunities for turns at expressing one's ideas and for receiving more feedback on them from a wider variety of people, and in a format which is easily retrievable (unlike audio-conferencing). Growing out of this high level of interaction and the permanence of the discussion record is the possibility of

a group creation, where people make leaps in understanding which are unlikely to happen when working in isolation. Thus by enhancing the potential for interactivity, CMC allows students to personalise and control their learning activities and environment far more easily than with traditional methods.

The fact that CMC possesses certain advantages over other interactive media, however, does not necessarily mean that it should be considered as a complete substitute form of interaction. Lack of choice in teaching media is an impoverishment of the learning environment, and it is surely better to make available a range of options for interactivity, rather than assume that one technology can cope with peoples' varying communication needs, moods, and situations. Furthermore, although electronic mail and conferencing may well replace a certain proportion of the telephone communications that typically take place between tutors and students, CMC cannot effectively substitute for certain specific properties of voice communication - especially the intimacy and the spontaneity of response. Likewise, at least in the immediate future, it is difficult to imagine how CMC can replace the carefully positioned hand-written comments, sketches, and other graphic codes that a tutor might write on the draft of a piece of work submitted by a student.

The quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals and not in groups, with the possibility of occasional meeting for both didactic and socialisation purposes.

Most distance education programs in developed countries regard face-to-face meetings as an important element of the learning system. Such meetings are used for tutorial discussion, seminars, practical work, trouble-shooting, and counselling, as well as to provide opportunities for socialising for students who feel particularly isolated.

CMC should probably not be seen as a substitute for such face-to-face events, but rather as a means of continuing to serve a number of the above functions conveniently and effectively in between occasional meetings. A group of learners who have already met each other in person, in the presence of a tutor, are more likely to be able to communicate effectively online because the personal meeting has provided a number of contextualising cues which would otherwise be absent from discussions held exclusively within the framework of a computer conference. The advantages of conferencing in the context of group tutorial work lie in the time it provides for reflection and reading, as well as the retrievability of other participants' messages. Its educational potential lies in the entirely new possibilities it opens up for collaborative work and joint projects between students - projects which might be launched at a face-to-face meeting, pursued in the framework of a conference, and then finalised at a further face-to-face meeting.

The Industrialisation Descriptor

Keegan's 1980 definition of distance education incorporated an element from Peters' industrialisation theory: *the participation in an industrialised form of education which, if accepted, contains the genus of radical separation of distance education from other forms.* Although this element was subsequently withdrawn by Keegan as critics had argued that it did not apply to all forms of distance education, its relevance to mass distance education remains valid. The industrial practices of division of labour, production-line methods, market research, product testing and emphasis on cost-effectiveness apply in some degree to the dedicated distance teaching institutions set up in Thailand, Indonesia, China, India, the UK and other countries. These institutions are dealing with student numbers in the 100,000 - 800,000 range. Experience from such institutions indicates that large scale projects are necessary to produce courses of consistently high quality, to maintain continuity and institutional

stability, to achieve economies of scale and to gain access to the public broadcasting networks, to the best publishing expertise, to good computing facilities, and, most importantly, to a wide range of adult students and top-quality tutors.

The question of how to use CMC effectively in the context of such large-scale programs is a difficult one, and raises more issues than does the integration of other interactive opportunities such as face-to-face meetings or telephone audio-conferencing into high population distance education courses. In these cases, the individual tutor is more or less entirely responsible for his or her own group of 20 or so students, and each such group is relatively isolated from the others. However, with CMC, any one student or tutor on a large population course could easily contact any other student, tutor, or central faculty member, and this potential for lateral communication and networking brings an entirely new dimension into the traditionally hierarchical distance education model (Mason, 1988b). CMC has already shown itself to be a valuable educational tool in small-scale distance education programs. The completely online courses offered by Connected Education under the leadership of Paul Levinson, as well as the graduate courses run largely online by the Ontario Institute of Studies in Education are just two examples of successful applications on a small scale (Levinson, 1989; Harasim, 1989a; Davie, 1987). Can this medium humanize and individualise education on the large-scale model? How can conferencing, which is essentially a labour-intensive medium, have any application in the mass education market-place? These questions must be addressed in any analysis of computer conferencing in mass distance education.

The Privatisation Factor

Keegan 'demoted' the industrialisation factor from a descriptor in 1980 to a 'socio-cutural determinant' in his 1986 revision. He also added a second determinant: the privatisation of institutional learning.

> A distance system takes the student from the learning group and places him/her in a more private situation. Learning is often private when it is not institutionalised. (p 49)

Garrison and Shale (1987) in their critique of Keegan's position claim that telecommunications technology can now facilitate and influence group learning at a distance, and that the privatisation factor therefore is no longer appropriate. Keegan's choice of the word privatisation may be unfortunate in the light of its present application to mean the transfer of publically owned enterprises into privately financed ownership. However, his inclusion of this factor is very much a reflection, whether intentional or unconscious, of the general trend towards privacy in our society.

> The argument that lifestyles are becoming increasingly private is based on the observation that affluence and technology allow us to access many things in our homes that once were only accessible by leaving them...Whether it be home swimming pools or video-cassette recorders, wherever a product has enabled a previously public act to be carried out in the convenience and privacy of home (or work), that product has been a success. Distance education is such a product. (Smith, 1987, p 30-31)

Computer conferencing is an example, *par excellence*, of a product which enables the previously public act of attending seminars to be carried out in the privacy of the home. Far from rendering Keegan's privatisation factor inappropiate, telecommunications technology may actually contribute to this

trend, namely, the desire to interact with others, without leaving the privacy of the home. Garrison (1989), subsequently explains that with the new telecommunication technologies, distance education is no longer a private, that is, lonely, form of learning. The various interpretations of 'private' - not available for public scrutiny, or withdrawn, or simply not part of a group, and which element is private - the student or the communicating material - are confusing the issue somewhat. With computer conferencing, the student can be private, but the communication is public to the group. Perhaps this debate can be concluded by the acknowledgement that computer conferencing makes possible the paradox of private, group learning.

THE CONVERGENCE HYPOTHESIS AND CMC

Whether place-based and distance education are on a path of convergence towards open learning in terms of their methods and their clientele, will not be finally settled here; however, an obvious conclusion from this analysis of Keegan's descriptors and the advent of CMC is:

- the breaking down of conceptual distinctions between distance education and place-based education, primarily because of the opportunities which CMC provides distance learners for discussion, collaborative work and the development of autonomy in learning, and also because of the potential for building a sense of community amongst the participants in large scale distance education institutions.

Garrison and Shale (1987) also predict that recent innovations in communication technology have made the boundaries between distance and traditional education less distinguishable. They feel that Keegan's descriptors of distance education are too heavily derived from print-based examples and do not adequately take account of the new generations of technological

delivery. They stress the capability of the Information Age technologies to provide interactive and individualised education, and to 'demassify' delivery:

> The future task for education at a distance is to design and direct personalised information to specific target audiences. The industrialised form of distance education, with its mass-consumption ideology and approach, will become less dominant in the future. (p 13)

Kaye (1989) adds, "It is also my experience that CMC is seen by some colleagues in distance teaching institutions as a way of returning to a more intimate and cooperative form of group-based learning ('real' university education), and by colleagues in traditional institutions as a way of extending the resources of the classroom to those unable to get to the campus. " (p 9)

Classifying distance education systems historically, Nipper (1989) equates the first generation of distance learning with correspondence teaching, based primarily on the medium of print. The second generation he defines as multi-media systems, developed since the late 1960's which integrate broadcast media, cassettes, and to some degree computers, with print. The basic pedagogical, social and institutional concept underpinning these systems is that teaching is a process of structuring and distributing information, and learning is the acquisition of information. He goes on to predict that the key element in the third generation models of distance learning will be communication and the notion of learning as a social process. This will lead to the locus of control moving from the teacher and the teaching material to the group and the processes generated by the group. By dismantling the authority structure of large-scale, distribution-based distance education institutions, computer conferencing could solve the problem of social distance in learning at a distance (p 71).

While Nipper's analysis is derived from his experience of telecommunications and distance education in Denmark, Castro (1988b) echoes his conclusions from her analysis of the Australian distance education scene:

> ...despite these problems caused by distance, teaching as dialogue is getting increasing support as some institutions and distance educators try to break away from the grip of text centred and teacher centred education. (p 190)

Harasim (1989a) claims that theoretical or practical models drawn from either distance education or place-based education are not adequate to inform or explain the activities of online education. She uses three intersecting circles to depict her view that computer-mediated communication is a new domain for teaching/learning. It has some of the aspects of face-to-face teaching (interactivity, group learning, social context to learning) and some of the advantages of distance education (time and space independence). By viewing CMC as a unique medium, its potential will best be realised.

The unique nature of online education is echoed in the writings of many experienced online teachers (see Mason and Kaye, 1989b). Kaye (1989) characterises this uniqueness as a combination of two features of computer conferencing:

- it is essentially a medium of written discourse, which nevertheless shares some of the spontaneity and flexibility of spoken conversation
- it can be used as a powerful tool for group communication and for cooperative learning.

It might be useful to extend the first characteristic by noting that the writing happens over time. Although there are several teaching media which use the written word, there are no others which develop spontaneously over time. The second characteristic, cooperative group learning, depends on the basically

interactive nature of the medium. The unique features of computer conferencing as a teaching/learning medium would then be:

- it is a literary medium which develops over time
- it is inherently interactive and can support cooperative group learning.

SUMMARY

The enormous diversity of organisational structures which teach 'at a distance' makes a mockery of attempts to provide definitions and theoretical frameworks that are both comprehensive and more than hopelessly broad generalisations. The one common thread in most discussions of distance education is that the teaching and learning activities are separated both by time and space. The theoretical frameworks chosen for this thesis to illuminate the role of CMC in distance education have been described as:

- the nature and degree of student independence and autonomy
- the notion of learning as an interactive, social activity
- the quasi-industrial nature of mass distance education provision
- the way in which the use of computer conferencing breaks down the distinction between place-based and distance education.

The case study presented in this thesis concerns the introduction of computer conferencing, an interactive and 'autonomy-enhancing' communications medium, into a mass distance education institution operating in a quasi-industrialised mode. The theoretical frameworks outlined above will provide the main structure for the analysis of this application of computer conferencing, and the convergence hypothesis will be examined and tested by this case study.

CHAPTER TWO: THE OPEN UNIVERSITY

THE OPEN UNIVERSITY AS A DISTANCE TEACHING UNIVERSITY

The case study of this thesis concerns a particular application of computer conferencing at the British Open University. In order to understand the nature of this application, and to distinguish what is unique to this institution from what is common with others, it is necessary to highlight certain aspects of the University's history.

In the previous chapter, it was stated that the Open University (OU) is one of the archetypal distance teaching universities. These institutions are fully autonomous, in terms of control over curriculum and granting of degrees, and generally cater for very large numbers of students. They typically embody various aspects of 'openness' such as: open entry (no previous qualifications required), independence of time and place constraints for studying, and more flexibility in credit transfer.

The OU was founded in 1969 in the face of considerable scepticism by academics, politicians and the national press due to the overwhelming faith in face-to-face tuition as a *sine qua non* of higher education. Since the much publicised success of the OU in producing large numbers of graduates of university standing at a fraction of the cost of place-based institutions, many other 'open universities' have been founded in countries all over the world[1].

---

[1]The present Vice Chancellor, J. H. Horlock, contrasted two press views of the OU in the February edition of Open House, 1989. "In 1966, the Times Educational Supplement wrote 'Mr Wilson's pipe dream of a university of the air, as vague as it is insubstantial, is just the sort of cosy scheme that shows the Socialists at their most endearing but impratical worst.' But in November 1988, the Financial Times could write, 'the OU has been outperforming the rest of the higher education sector in value for money, in widening access and in responsiveness to customer needs for two decades.'"

The historical aspect of the OU's founding which most concerns this thesis is the means by which the University carried out this remarkable and "almost miraculous" (Perry, 1981) leap into the uncharted waters of mass education at a distance.

> The Open University was established to capitalise on the techniques of correspondence study linked with the new educational media. The use of correspondence teaching methods at the higher education level was not in itself a new development, nor was the use of broadcasting (radio and television) for educational purposes. The Open University's special contribution to the development of distance education has been to take these various media and to integrate them in highly structured courses which are generally recognised as being of outstanding quality, both academically and pedagogically. (Rumble, 1982: 43)

The University has a long history of experimentation with new media for the delivery of its teaching. The use of educational broadcasting is the most prominant example, but more innovative examples include audio and video cassettes, home experiment kits, and computers both in stand-alone and online mode. However, these technologies have always been used to enhance rather than supplant the standard print-based home study course. In common with most of the distance teaching universities, the OU has a conscious and systematic approach to the integration of its teaching materials (Rumble and Harry, 1982: 222).

This chapter will look at three elements of the distance teaching system at the OU: the students, the tutors and the course team. The analysis of the student perspective will be carried out in the light of the first of Keegan's theoretical frameworks - independence and autonomy. The role of the tutor will be analysed from the perspective of the interaction and communication theory, and the course team activities will be looked at as an example of Peter's theory of industrialisation. The discussion will then concentrate on the multi-media

context of the OU and its new Home Computing Policy, and finally focus on the particular course involved in this study.

THE STUDENT

No formal educational qualification is required of applicants and in this sense the OU has always been committed to widening educational opportunities. It has often been pointed out, however, that targetting a working class student intake has never been a University priority (Rumble, 1982; Perry, 1976; Tunstall, 1974). Harold Wilson in his early speeches about the proposed 'University of the Air' was more concerned with extending opportunities for technological education and with harnessing technological advances in the media of mass communication for the benefit of distance education (Perry, 1976).

Over the nearly 20 years of the OU's operation, the undergraduate student profile has changed in a number of ways:

- The number of women students has increased to nearly equal male students.
- The younger age groups of students are decreasing and the 35-45 group is expanding.
- The proportion of students with no formal educational qualifications on entry has remained somewhere between 7 and 10%, and those with a degree or higher on entry has risen to 10%.
- The occupation of students has changed with the initial high percentage of non-graduate teachers falling and an increase in the percentage of students 'at home' or 'not working'.

The OU's acknowledged success in preventing excessive 'drop-out' of students (Harry, 1982) is thought to be due to the dual emphasis on high quality correspondence material plus the attention given to student support services (Keegan, 1980; Sewart, 1978). The latter consists of face-to-face meetings: tutorials, day schools, summer school and other occasional meetings with a tutor or counsellor, and alternative forms of contact: the student newspaper, contact with other students in a self-help group, and correspondence and telephone calls to the tutor, counsellor, the regional office or the central institution.

> The UKOU is an example of high resource provision in the area of student-support services (nearly 30 percent of its total budget is allocated to such support). This stems from an early decision (Report of the Planning Committee, 1969) to regard part-time face-to-face teaching and group discussion as component parts of a *fully integrated teaching system.* (Robinson, 1981: 145-6)

The considerable amount of feedback from students collected by the University's Institute of Educational Technology (IET) indicates that on the whole they are very positive about their experience of studying with the OU. Rogers (1974) accounts for it thus: "Perhaps this strong sense that social and educational justice is at last coming their way accounts for the almost religious fervour and gratitude with which so many students speak of the Open University" (p 81). Results of an extensive survey of 4,500 OU graduates shows an overwhelming response about the good effects of OU study on them 'as a person'. "Follow-up questions revealed increases in their self-confidence, maturity and ability to communicate and the acquisition of new ideas and perspectives" (Woodley, 1988: 15).

This feedback from students has always been at odds with the commonly held view of many academics, who have graduated from place-based universities. This view is most eloquently described by van der Eyken (1974):

> What it (the OU) does not offer, of course, is the traditional quality of undergraduate life; the association with a 'community of scholars' and the social life amongst one's peers, the varied opportunities to extend one's leisure interests, the chance to broaden horizons among the mutifarious student clubs. Correspondence courses, by their nature, are very much a 'nose-to-grindstone' business. The question here is--how important are these other, Newmanesque, elements, and how high do we rate them in our scales of values, as priorities begging for government funds? (p 30)

Escotet (in Rumble and Harry, 1982: 234) is more disparaging: the distance teaching universities provide distance *instruction*, not education which implies a social and cultural contact lacking in distance learning. The survey of graduates confirms that the main outcome of OU study for most graduates has been in the area of personal development - the Newmanesque elements, not in instruction, career advancement or job change, or financial gain from graduation. This slight disparity between what educators think students do and do not gain from OU study and what students say they gain, will be taken up later in Chapters Five, Six and Seven.

To what extent are OU students independent and autonomous learners? Does the theoretical framework presented in Chapter One usefully illuminate the student perspective? It seems to be an accepted though untested fact that "high levels of motivation are the general rule amongst distance students" (Kaye and Rumble, 1981). Open University students have taken a conscious decision to study at a distance, although it is a source of some speculation whether they prefer studying independently, whether they become resigned to it through lack of alternative, or whether they are habituated to it by the nature of OU packaged courses. In any case, the OU can do much to strengthen and deepen student motivation and commitment by encouraging a sense of participating

in a significant enterprise and sharing with other students similar aspirations towards study and personal achievement (Goodyear, 1976).

Thorpe (Thorpe *et al.*, 1987) usefully points out that it is the *quality* of student motivation which matters, and not just its strength. By this she means the particular mixture of reasons students have for registering in the first place. Morgan *et al* (1981) have shown that OU students' approach to study is linked to their conception of learning, and that their approach is a decisive factor in determining the nature of their learning outcomes. They prefer to use the term 'orientation' rather than 'motivation', as it does not assume any psychological trait or state belonging to the student:

> It is a quality of the relationship between student and course rather than a quality inherent in the student. The analysis of orientation does not set out to type students, rather it sets out to identify and describe types of orientation and to show the implications these different types of orientation have for the approach a student takes to learning. (Taylor, Morgan and Gibbs, 1981: 3)

Laurillard (1978) has refined this research by showing that students' styles and strategies of learning are context-dependent: "rather than applying to individual students, dichotomised descriptions of learning are more readily applicable to students in particular learning situations" (p 1). Brew (1987) usefully redirects the argument by looking not at how the isolated student studies, but at the Open University as an arena for students to articulate their choices about learning - by giving them the freedom, the power and the support to grow as learners. Taylor and Kaye (1986) evaluate one of the University's attempts to do this: by creating a course which emphasises the independence and autonomy of the adult learner and which uses an andragogical approach to deliver the course. Morgan (1987) discusses the value of another technique which the University has used: project work which encourages students' development as learners and enhances the quality of

what they learn. Jarvis (1981) lists other ways in which the University could take a more andragogic approach: discovery learning, self-selection of course materials and problem-centred rather than subject-centred learning.

This examination of the extensive research carried out by the OU's Institute of Educational Technology over the last 12 years into the nature and requirements of OU students, shows a clear bias. This is towards looking at the inter-relationship between the student and the institution, and the degree to which a rich learning environment can be experienced by OU students. The independence and autonomy of OU students is best measured by the degree to which they are allowed and encouraged to make choices about their learning. The University's adherence to the importance of student support services and its research into students' needs and motivations makes the independence and autonomy theory of distance learning a vital, though not complete framework for understanding the OU and the case study of this thesis.

THE TUTORS

One of the main functions of a correspondence teaching system is the assessment of student work - grading and commenting on assignments and essays. Tunstall (1974) points out that although this job is quite common in Britain and the US - extra-mural teachers and teaching assistants - the OU 'course tutors' have a more demanding job because not only are they employed part-time, but they are outsiders to the system which provides all the teaching materials the students require. The tutor is thus an agent or facilitator of learning, rather than the source of it. However, Perry (1976) points out, that the marking of assignments at the OU was always seen as a method of teaching as much as a method of assessment. Right from the beginning, therefore, there has been a certain ambiguity in the conception of the OU tutor's role.

The second important function of the OU tutor is to conduct face-to-face tutorials and generally to counsel and support students. This provision is a central tenet in the concept of the Open University as outlined above. However, Perry (1976: 113) makes it clear that because many students could not travel to study centres, and specialised or advanced courses could not support local tutorials, the face-to-face tutorial must be regarded not as an integral part of the teaching programme but as 'remedial' - available as an optional extra to those who could attend them and who were having difficulty in comprehension. Furthermore, the amount of face-to-face tuition provided on many courses is extremely limited: the average allocation of tutorial contact time for a half credit course is seven hours for each group of 20 to 25 students. Due to the wide geographical spread of students in any such group, this provision may take the form of one or two half-day schools during the course. In some cases, no face-to-face contact can be provided, and tutorial support will be on a one-to-one basis by telephone, with the seven hours being apportioned between the whole group of 20 students (giving about 22 minutes each) (Rumble, 1982: 38). So the second role of the tutor is also tinged with ambiguity - tutorial provision is both central to the OU's strategy and an optional extra for students.

Rumble's transactional model of distance education (1986), whereby the relations among the many participants in an institution are the central focus, provides a means of looking at the tutor's role in relation to the whole functioning of the OU.

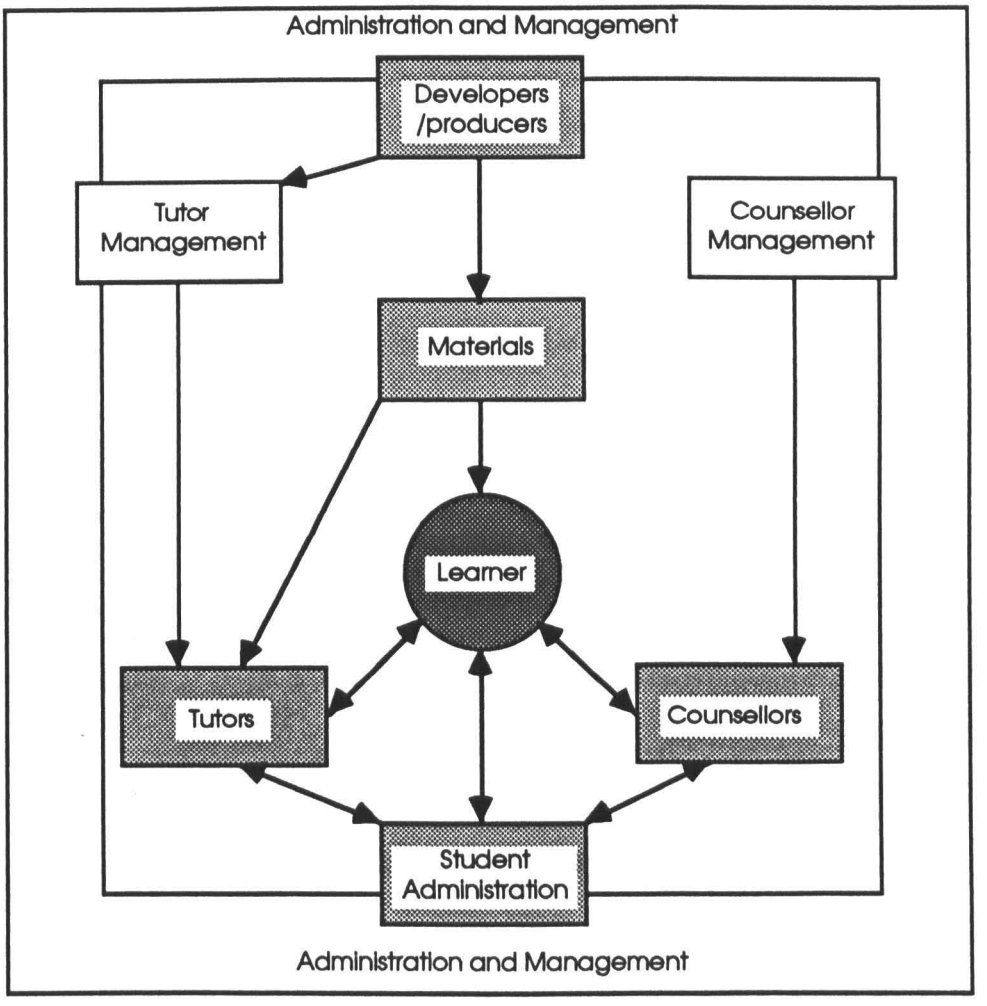


Figure 2.1 Transactional Model of Distance Education[1]

Figure 2.1 shows that tutors have direct interactions with students, with course materials, with their regional management and with the student administration section of the central organisation. They have only indirect communication with the course developers and producers. Feedback from tutors to the course writers is haphazard, and usually mediated by other people or through questionnaires and surveys. This shortcoming in the OU system has been acknowledged most recently in a report by the Steering Group for the Academic Review of the OU. Among its recommendations to the University it concludes that: "Resources should be allocated to involve tutors and tutor-counsellors more extensively in course production and course presentation"

---

[1]This diagram is reproduced from G. Rumble, *The Planning and Management of Distance Education*, 1986, Croom Helm, with kind permission of the author.

(First Report, 1989). Not only are course writers impoverished through lack of the tutor perspective and input to the course, but tutors themselves are continually in the awkward position of supporting a system and its products, which they have no part in designing.

Despite the low attendance rates at face-to-face tutorials, feedback from students has shown considerable student outrage at attempts to reduce tutorial provision (Mason, 1986). Some students clearly regard the tutorial as an important aspect of belonging to the University and as the feature which distinguishes their education from correspondence teaching (p 2). Attendance rates vary depending on region, faculty and level of course; however, about 25% of students never attend a local study centre, 25% attend regularly and the rest occasionally. By comparing student attendance at tutorials, with similarly 'under-used' provisions, such as TV and radio broadcasts, home experiment kits and even set texts, Sewart (1987) points out that it would be simplistic to try to take student usage as the sole determinant of the value of an element in the OU system (p 36).

Kaye points out another ambiguity in the system: the facilitating role of the OU tutor is at odds with some entrenched views of both tutors and students, that the tutor's role is to lecture. Even where tutors try to change their style, pressure from students often forces them back to a more authoritarian or didactic style (Kaye and Rumble, 1981: 154).

This analysis of the role of the OU tutor has attempted to apply the interaction and communication model outlined in Chapter One to the case of the Open University. There is considerable commitment amongst OU staff to the importance of interaction with students (Perry, 1976; Bates, 1988; Sewart, 1987). However, the cost of providing tutorial support is closely tied to student numbers. "Obviously, as the amount of face-to-face tuition provided increases, so the basic characteristic of distance teaching, the physical separation between teacher and learner, is lost, and with it the potential for economies of scale"

(Rumble, 1988: 97). Consequently, there is considerable interest in a method of providing non-contiguous two-way communication amongst students, tutors and course developers.

THE COURSE TEAM

The production and distribution of its range of learning materials has led the OU to adopt a number of quasi-industrial processes as outlined in Peters' theory of distance education in Chapter One. First of all, there is a marked role differentiation of staff associated with the use of various media and with the various processes of course creation, production, distribution and assessment. The creation and production of courses are handled centrally, while the tuition and assessment are localised in 13 regional bases spread throughout the country. Secondly, as much of what goes on at the OU is concerned with producing a product, namely the materials for home study, the inevitable result is a standardised, mass produced package, no matter how high the quality. Thirdly, the need for hierarchical management techniques and structures to cope with the industrialised aspects of the OU is often at odds with the participative, democratic decision-making processes of the academic foundation of the University (Rumble and Harry, 1982).

Kaye and Rumble (1981) have applied Peter's principles to the OU in the form of a Systems Model, which demonstrates the 'assembly line' process of course creation, production and distribution. It shows how this process is separate from the student subsystem, which manages and controls the students' progress through the institution. This model enshrines the notions of division and specialisation of labour. The rationalisation and standardisation of industrial processes are most apparent in the practices of the course team.

The Open University course team has been variously described as a curse (Drake, 1979) and as the most important single contribution of the OU to

teaching practice at the tertiary level (Perry, 1976). The standard of course material, its creation and delivery are all the responsibility of the course team, and ultimately of the course team chairman. The team generally consists of academic staff, a BBC producer, an educational technologist, a course coordinator, an editor and possibly a member of the regional academic staff. The number of authors and consultants may vary from one or two to twenty and the process by which the units are prepared and put through their various drafts also varies considerably (Rumble, 1982: 92). The initial creation of the course is separated from the maintenance phase, which may last up to eight years. In the latter stage, new assignments and examination questions must be written, and modifications to the course material are made in the light of feedback from students and tutors.

The debate about the positive and negative features of the OU course team has largely been carried out in the pages of the journal most closely associated with the University, *Teaching at a Distance* (now *Open Learning*). The arguments have been ably summarized by Rumble (1982); however, one aspect of the debate is worth highlighting here. One of Drake's criticisms of the practice of university lecturers working together as a team to write course materials is:

> Most academics are more interested in gathering and analysing information than on projecting it. Teaching is not their primary interest. Put a group of academics together, isolate them from students and you exacerbate this tendency. (p 52)

Apart from summer school teaching, most OU academics have no responsibility for direct face-to-face teaching of students and very little contact with them at all.

A second aspect of course team experience relevant to this thesis is the wholesale catapulting into public visibility of an activity heretofore very private: the teaching process. "It is one of the canons of national education

that a teacher is not only master in his own class, but that it is understood that he will perform his function unmonitored, unwitnessed even, by a single other colleague" (van der Eyken, 1974: 31). The essence of the course team approach is the cycle of drafting course material based on the feedback of colleagues. This critical, judgemental activity can and does lead to considerable resentment and bitterness.

The final course team issue to be raised here is the perspective outlined by Farnes (1976). He noted that the exciting and rewarding learning tasks in the OU are carried out by the course team, not the students. It is the former who are involved in the acquisition and organisation of knowledge, the evaluation and selection of materials and the design and presentation of programmes and activities. It is the student who must adopt a relatively passive approach as he learns from the polished product of the course team interactions. The breaking up of the packaged OU course - by greater use of projects, by student choice of learning materials, or by student-set learning goals - would require a profound change in the nature of the course team as well as in the areas of production, distribution and support of students. Considering this prospect Kaye and Rumble conclude:

> Courses, instead of being integrated and coherent structures, would need to become modular packages from which the student could select the material he needs for his own project or programme of study. It is doubtful whether the administrative and production systems of the UKOU - or of many other large-scale distance systems - could cope with this challenge as they are structured at present. (p 287)

Chapter Seven will show how the course team system fared when confronted with the medium of computer conferencing, and how the quasi-industrialism of its management withstood the pressures of interaction with students.

MULTI-MEDIA AND THE OPEN UNIVERSITY

From its conception, the OU was committed to delivering its material through a variety of media: television, radio, correspondence materials, programmed instruction, tutorials and short residential courses. The University has developed considerable expertise in the understanding of how to exploit various media. Bates (1988) describes the value of television in teaching abstract ideas through the use of concrete examples, as well as in bringing unique audio-visual resource material to students, which encourage the development of skills of analysis, application and evaluation. Audio cassettes are used, not as lectures, but in conjunction with printed texts, talking students through diagrams, illustrations, statistics, or providing discussion material for analysis. Teaching by computer has been carried out by the OU for over 15 years through the use of 'dumb' terminals in study centres linked by telephone line to a mainframe at Walton Hall. This allowed sophisticated teaching material exploiting the power of a mainframe to be accessible to students all over the country.

It is a curious fact that despite failures in many of these attempts to harness the power of technology to improve learning for distance students, the value of multi-media teaching remains unchallenged at the Open University. In fact, it continues to be championed: as a way of providing variety, increasing motivation and to cater for different learning styles and approaches (Bates, 1988). Shale (1987) goes so far as to claim that there is little doubt that this 'technological revolution' has largely not lived up to expectations. Bates (1980) admits that "television and radio in particular are proving to be of less significance in teaching systems or more difficult to use successfully than was originally expected" (p 93). The Cyclops audio graphic tutoring system was experimented with during the early 80's, but its use was not successful enough

to be extended within the OU[1]. Similarly, telephone teaching has never been used extensively by the University despite successful applications in some regions (Robinson, 1979; Bates, 1982). The use of computer terminals at study centres has always been plagued by booking difficulties, queueing to use the terminal, machine break-down, inefficient use of student time, and finally, the fact that 25% of students never go to study centres (Jones and O'Shea, 1982). Nevertheless, the Academic Review Steering Group urged the University to continue to pursue vigorously its lead in the field of multi-media distance teaching (First Report, 1989).

The use of media and combinations of media at the OU, and the enthusiastic attitude of OU staff towards experimentation with new media must be seen in the light of research on learning from media. It should be acknowledged at the outset that OU staff are generally aware of this body of literature, as frequent reference to it in their published articles makes evident. Clark's *Reconsidering Research on Learning from Media* (1983) is a good example of the research which shows that "media do not influence learning under any conditions" and that "media are mere vehicles that deliver instruction but do not influence student achievement ... only the content of the vehicle can influence achievement" (p 445). This research is looking at media as they affect student performance in final examinations. OU staff are primarily concerned with creating an interesting learning environment for students not with increasing their pass rate. Furthermore, this research only applies to material which can be delivered identically in any medium. In other words, once the unique features of a medium are exploited in the teaching material, the research results no longer apply. So the OU continues, as it always has, to see the various technological media as enhancing rather than supplanting the standard print-

---

[1]This system allows tutors and students to use a light-pen to write or draw on an ordinary TV screen. The picture is converted digitally to a second signal and sent down a standard telephone line, where it is decoded and appears on the TV screen at the other end of the line.

based text materials sent to students. They may have "failed to revolutionalise learning" (Shale, 1987), but they have added variety, enjoyment and enrichment to correspondence teaching for many students.

> There is no super-medium. Each can serve different functions. Thus media do not differ as much in their suitability for dealing with different *content* but do differ in their suitability for dealing with different *learning skills* or *teaching approaches*. Each medium therefore *enriches* or *adds* to the educational process. The logical consequence of this is not to select but one or two "super-media", but to use a range of media in a planned and integrated manner so that a variety of educational functions and approaches can be offered. (Bates, 1982: 14)

There are signs of a general trend in the educational use of technical media towards exploiting those which both offer the students greater control of its use and permit two-way interaction between teacher and taught (Wenger, 1987). The OU has found, for instance, that audio cassettes are much more popular with students than radio broadcasting, because of the transfer of control to the individual student. As with many sectors of education at the present, interaction is the keyword for the continuing direction of the OU's policy on technical media.

HOME COMPUTING AT THE OPEN UNIVERSITY

The teaching medium which has received most attention at the OU since the mid 1980's is the Personal Computer (PC). As the use of study terminals proved unsatisfactory and as the price of microcomputers continued to decline, the idea of an OU policy specifying a machine for home use by students began to take shape. Rumble (1989a) explains the background to the final decision:

> In the past, when the University has required students to have access to a particular piece of equipment which is not (unlike radios and

> television sets) commonly found in homes, it has bought in the equipment and supplied this to students in the form of a 'home experiment kit'... In the case of certain consumer goods, the University has supplied students with equipment such as audio-cassette players and calculators for several years following their introduction into the market, until such time as the unit cost began to fall and they became a normal consumer durable which it could reasonably expect students to buy for themselves. This is not currently the case with microcomputers. However, cost projections indicated that supplying microcomputers to students on courses where computing was deemed to be an essential element would be beyond the University's capacity. (p 115)

The University met this need by defining an approved specification (an IBM PC compatible) and purchasing, with the aid of a £2.25m grant from the Department of Trade and Industry, a stock of these which students could rent. In addition, it made arrangements for students to buy their own machines through mail order, and provided a number of back-up micros for student use in study centres. Finally, all students on home computing courses were given a discount on their course fees, to bring the cost of rental down to below a figure of £100, and to encourage purchase. (This discount will be phased out by 1990.)

The use of home computing, particularly when used with telecommunications, is seen quite accurately as increasing students' costs. In addition to the initial investment in hardware, there are consumables like printing paper, ink, ribbons and disks, and when telecommunications are involved, there are telephone charges to consider. However, the OU Home Computing Policy must by any standards be considered a generous attempt to make mass provision for distance learners.

THE INFORMATION TECHNOLOGY COURSE

One of the three courses in 1988 which fell within the Home Computing Policy was DT200 *An Introduction to Information Technology: Social and Technological Issues*. This is a second level undergraduate course which explores some of the issues arising from the advent of Information Technology (IT). The course consists of seven 'blocks' of printed material, a Course Reader, audio and broadcast media and other supplementary materials. In addition to these 'standard' presentation media, this course sets aside 20% of the study time for practical work on the micro in order that students should gain direct experience of the social and technological issues discussed in the written material. Four software packages are introduced on the course; some are commercial: word processing, database management, and spreadsheet analysis, and one was specially developed at the OU: computer communications. The communications element, therefore, forms a very small part of the whole course.

Integrating the communications medium

A number of steps were taken to prevent this small communications element from being perceived by students as an optional extra, which could be ignored if necessary. In the first place, the communications package is used not only as a piece of IT software to be understood, experienced and mastered like the word processor, database and spreadsheet software, but it is also exploited as part of the tutorial support on the course. The 14 hours of tutor contact allocated to the course were divided approximately in half with three face-to-face meetings during the course, and tutor support on the conferencing system throughout the course, especially before the due dates of each of the seven assignments.

The second integrating feature of the communications element in the course was the design of the project, in effect, a double weighted essay which would assess all the practical elements of the course. The subject of the project is an evaluation of computer-mediated communication, based on the student's experience of it during the course, the textual material presented in the units and readings, and the reactions of fellow students. The latter information can be gathered directly from conferencing messages, but is mainly drawn from a database formed by all students uploading answers to two detailed questionnaires concerning their reactions and use of the conferencing system during the course, supplemented by questions on their own personal and educational backgrounds. Students are expected to download data and combinations of data from this remote database, present it in graphs and tables using the various software packages and write an assessment of some aspect - social, educational or technological - of computer-mediated communications.

The conferencing system

Following small-scale trials of the use of electronic mail on two courses at the OU (Henry, 1986; Emms and McConnell, 1988) and after an evaluation of a range of conferencing systems (Kaye, 1985, 1986), the Open University purchased the conferencing system, CoSy, from the University of Guelph, Ontario, in 1986. This system provides three areas for different kinds of communication. The electronic mail facility for one-to-one communication, a conversation area for unstructured, informal group discussions, and a conference area designed with many more facilities to allow interchange among any number of participants. Figure 2.2 shows how this was presented to students as a metaphorical Electronic Campus in order to help them develop a mental model on which to base the facilities and design of the conferencing provision for the course.

Each tutor on the course was moderator of a conference for his or her tutorial group of up to 25 students, thus forming an online classroom to discuss the assignments, practical work and course issues. These conferences were closed to other users in order to create a contained discussion area where students, having met at face-to-face tutorials, would feel confident to participate.

A read-only conference was set up for the course team to provide up-to-date information, stop press announcements and fixes for software bugs. Students could read these messages but not add comments.

Tutors were given a closed conference, which was a private space for them to discuss tutoring issues amongst themselves and provide feedback to the course team on the course generally and conferencing in particular. Students, likewise, were given a conference for socialising, a place to 'meet' others on the course with similar interests, to moan about course problems and to chat with other students.

Rather at the last moment, a forum conference was added where course issues could be discussed by all students, tutors and staff. Topics for each of the seven blocks were created, as well as for the project, practical work, errata and gremlins.

Although the conferences for the course were all prefixed with DT200, which is the number designated by the administration for the course, all of the open conferences on the system were available to students. The university does not operate separate systems for staff and students, so all staff with IDs on CoSy are contactable by students.

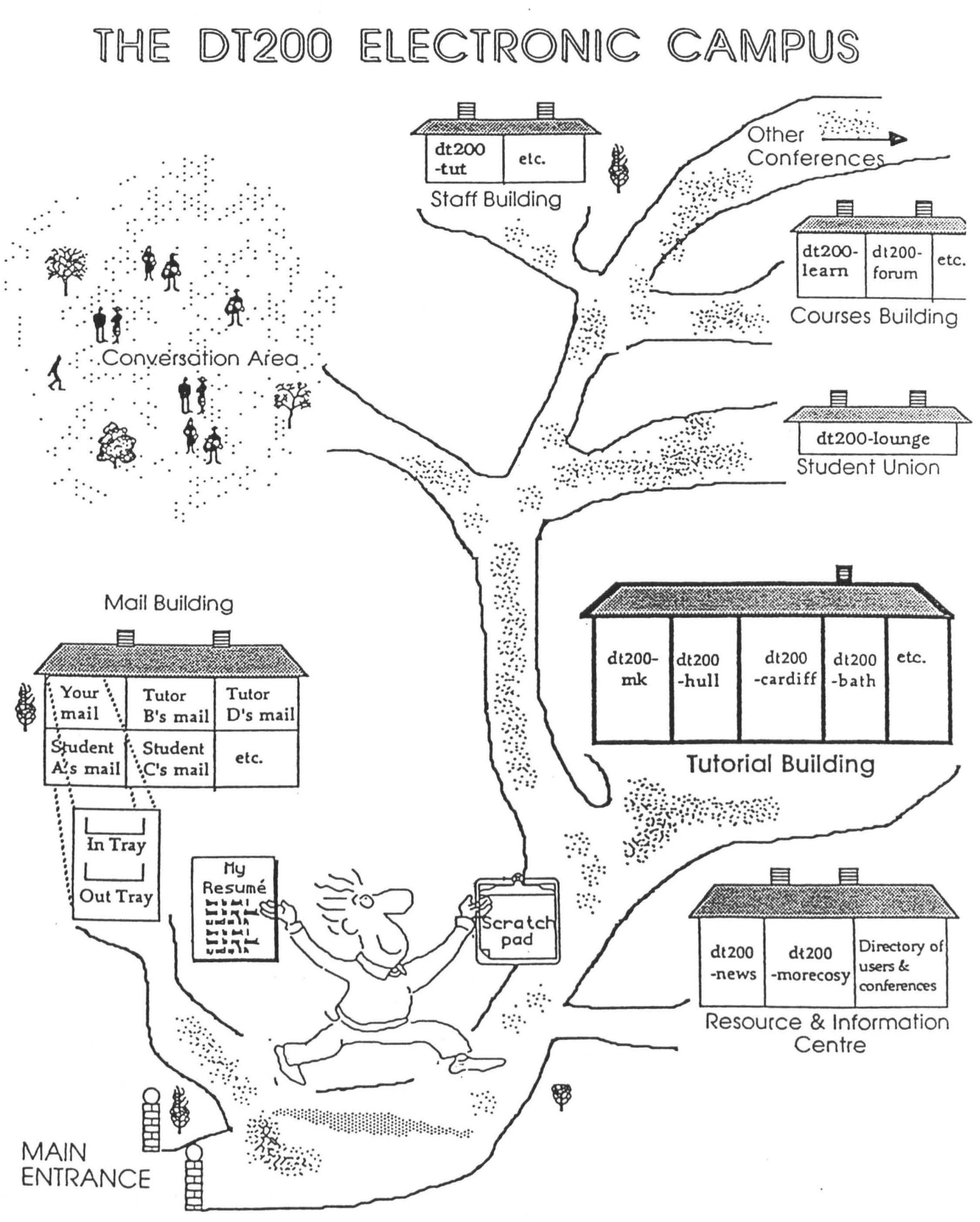


Figure 2.2 The Electronic Campus

The interface to CoSy

The conferencing system CoSy, was originally designed for access by on-campus terminals, with no connect charges for students - a different situation from the distance learning environment of OU students. The course team felt that this remote access by students required an interface which would provide automated log-on facilities and an off-line editor for the preparation of messages and reduction of connect charges.

Most applications of computer conferencing to date have placed great importance on an initial face-to-face meeting where users can be introduced to the basics of electronic communication and to the particular conferencing software. As this kind of hands-on experience would not be possible, a third facility was introduced to the interface - an optional menubar to help new users remember the commands and available activities.

This 'front-end' to CoSy, called OUCom, was designed and produced at the OU for use with the Pace Linnet Modem, which was sent to all students for the duration of the course. The interface consisted of an automatic dial-up and connection through to CoSy with a few key strokes, an off-line editor and an optional menubar when online.

Computer conferencing for OU students

There were a number of ways in which members of the DT200 course team expected that computer conferencing would appeal to students:

- convenience - Students would find that conferencing was more convenient than travelling to face-to-face tutorials and that electronic mail was more convenient than telephoning their tutor.

- increased access to help - Computer conferencing allows students to raise questions and queries, and receive replies and suggestions from other students as well as from the tutor, course team and other support staff.

- equality - Some students, especially those who do not respond well in face-to-face situations might find the concentration in this medium on content rather than physical appearance, to be liberating and conducive to participation.

- active learning environment - Some students would respond enthusiastically to the opportunity to take an active role - to initiate their own ideas, to contribute items from their occupational and personal experience, to comment on the messages of their peers and to experience a group learning environment.

- social needs - Students would appreciate the 'networking' aspect of conferencing for interacting with other students and participating in unpackaged, serendipidous encounters.

These positive benefits of computer conferencing did not overshadow the difficulties which the course team foresaw:

- technical difficulties - Some students would experience difficulties with the hardware or software on the course which the lack of in-person assistance would render all but insoluble.

- instructing at a distance - The lack of hands-on tutorials to introduce students to CoSy would place a heavy burden on the written instructions to provide the necessary back-up for all students.

- conceptual model of conferencing - Many students would find the unfamiliar etiquette of conferencing such a barrier that they would never become interactive users.

- inexperience of tutors - Many of the 65 tutors, most of whom had no experience of conferencing, would not be able to adjust to the role of moderator and online tutor.

DT200 AND THE THEORY OF CONVERGENCE

Computer conferencing is in many respects a labour intensive medium. One teacher supporting 25 students is the kind of ratio used in face-to-face teaching, and quite contrary to the whole concept of mass media-based distance education, which substitutes capital for labour. Capital in the form of print materials, audio-visual and computer assisted learning, replaces the traditional labour-intensive approach to education, in which there is a direct relationship between the number of students and teachers. With investment in learning materials, the development and production costs are high, but once developed they can be used for a number of years to teach any number of students (Rumble, 1989a: 146).

However, in other respects, computer conferencing is a medium which reflects the quasi-industrial practices common in mass distance education: rationalisation, mechanisation and mass production. As with print, one expert can with electronic efficiency convey high quality comments which all students can access. Through the automatic procedures of the host computer, information from the course team can be sent to each student's mail box. Students in the most remote locations are equalised in terms of access.

The use of computer conferencing on DT200 in 1988 was the first large-scale educational use of the medium. Furthermore, this use was integrated into a multi-media course presentation lasting over eight months. As part of the OU's long-standing committment to student support and encouragement to independence, the introduction of computer conferencing on DT200 was seen as giving students a chance to express their views, to interact more extensively

with each other and with their teachers, and to experience some of the 'serendipity' of a real learning environment (Kaye, 1987a).

Computer conferencing as used on this course, therefore, combines some of the methods of place-based education with some of the practices of mass distance education. Furthermore, conferencing has many of the properties required of an 'open learning' situation. It is much more student-centred than print or other one-way media; it offers greater control to students over when and how to study, and it facilitates lateral rather than hierarchical communication patterns. As described in Chapter One, Smith and Kelly list three areas in which they predict convergence occuring: methods, clientele, and open learning. The use of computer conferencing on DT200 is consistent with this movement in two of them: methods and open learning.

CONCLUSION

The three theoretical frameworks described in Chapter One and applied in Chapter Two are each valuable for understanding various aspects of the OU system. The theory of independence and autonomy is useful for looking at the OU student and those elements of the system which permit choice and foster self-direction. However, this framework does not particularly illuminate other aspects of the OU - the creation, production and distribution of correspondence material, for instance. The theory of interaction and communication provides a useful framework for looking at the interrelations between the various human elements of the OU system, but a good deal of mass distance education provision is *not* about human interaction - it is about achieving economies of scale and managing a workforce made up largely of non-academics. Thirdly, the industrialisation theory is ideal for understanding the economic rationale of mass distance education, but quite inadequate for explaining the complexities of the students' requirements. Finally, the convergence hypothesis is particularly appropriate to an analysis of

telecommunications in distance education, but does not pretend to be a comprehensive theory of the field in general. The separate chapters on the DT200 students, tutors and course team (Chapters Five, Six and Seven) will continue to draw on these frameworks.

CHAPTER THREE: LITERATURE REVIEW

INTRODUCTION

The previous chapters have prepared the ground for a case study presentation of the use of computer conferencing on the Open University course DT200 in 1988. This chapter will bring into focus the nature of the study by categorising the work of other researchers and practitioners in the field, and drawing out the ways in which this study is both a unique and a valuable contribution to the current position of research in this area. The second purpose of this chapter is to introduce the research questions which will dominate the remainder of the thesis. These questions will evolve naturally as the details of the case study are focussed and sharpened. Finally, the aim throughout this review of the literature is to demonstrate that a case study of the kind proposed builds on the work of other scholars and extends their results into new areas.

The literature which this chapter aims to review is that specifically concerned with computer conferencing. Even works relating to electronic mail will only be referred to in passing. As a case study of a particular implementation of computer conferencing, the thesis will concentrate on the issues surrounding the use of this medium. Other works describing, analysing or reporting on computer conferencing, therefore, form the research context within which this case study will be set.

A number of different ways of categorising the body of literature on computer-mediated communication are possible. Indeed several have already been presented in various literature reviews: Harasim and Winklemans (1988) suggest five categories - (1) sociological effects and impacts, (2) social psychology and behavioural change, (3) organisational impact (4) technical research and development and (5) educational research and development. Lea (1987) suggests four categories based on the method of evaluation used - (1) synthetic

approach (2) longitudinal/evolutionary approach (3) comparative approach and (4) social psychological approach. Both Kerr and Hiltz (1982) and Vallee *et al* (1978) refer to the literature as being either conjectural, speculative projections or application-oriented descriptions. These approaches all have their merits; however, none proved particularly appropriate for illuminating the nature and place of this study. The following diagram was derived from an extensive and broad-ranging search of the literature specifically relating to computer conferencing. The divisions are offered not as mutually exclusive categories, but as demarcations of perspective and area of concern. Each division locates and defines more clearly the position of this study in the overall field. By working through Figure 3.1, and drawing out what is common in each branch to the proposed case study, the questions motivating this thesis can be framed and elucidated.

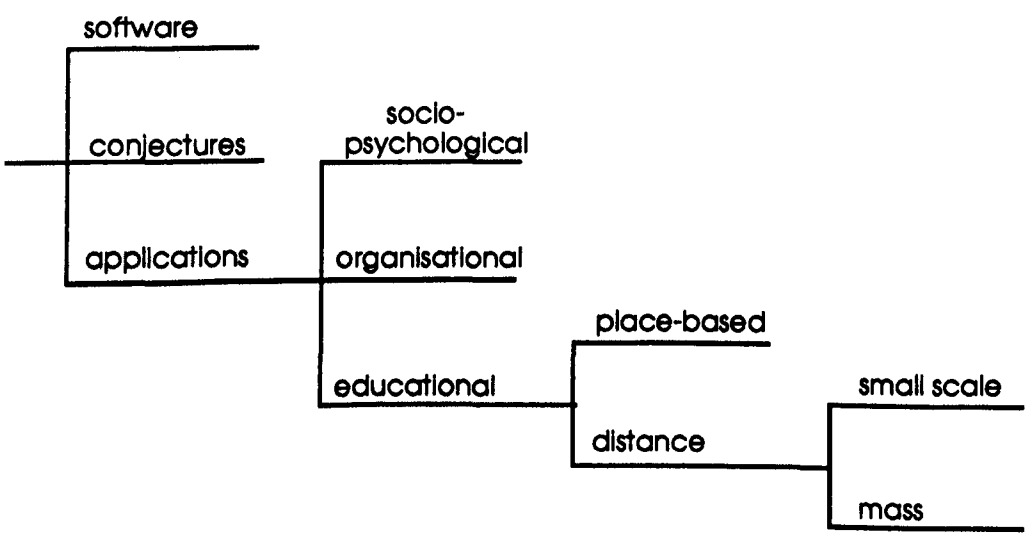


Figure 3.1: Categorisations for a Literature Review

DIVISION 1: SOFTWARE - CONJECTURES - APPLICATIONS

Software

Research and discussion on the technical aspects of conferencing software are outside the scope of this thesis. However, the work of Turoff (for example, 1989) is an excellent starting point for investigation of this field.

Conjectures

Two of the major practitioners in the use of computer conferencing, Paul Levinson and Andrew Feenberg, are in fact, the main contributors to the speculative writing in the field. Both pursue a line of inquiry from a specific perspective, yet their conjectures are grounded in considerable experience.

Levinson's (1989) analysis of CMC in relation to other media (the book, audio-visual media and face-to-face meetings) is especially relevant to the multi-media foundations of the Open University:

> The plain fact is that books are in many ways very inefficient. Their pages can contain but one set of text, whereas an electronic medium can in principle contain anything and everything written into it and over it; books take up considerable space in libraries and bookstores, whereas electronic media can be much more easily stored, and thus accessible to greater numbers of people. Defined as an off-line text, my guess is that the book, in electronic disk or CD-ROM from, will be an integral partner of online education for some time to come. Defined as a print-wedded-to-paper text, my guess is that the book's days are numbered both in online and in-person educational environments. (p 46)

These speculative conclusions fall outside the scope of this work, given the short term context of this one year study. Feenberg's writing is usually

devoted to speculation on the social and psychological conditions of conferencing (Feenberg, 1989; Feenberg and Bellman, 1989). His outline of 'communication requirements' and suggestions for conference architecture which meet different configurations of needs, provided support for some of the conclusions and recommendations drawn from the data in this study. Other speculative writings include those of Boyd (1987 and 1989), Beckwith (1987) and Markus (1987), all of which add 'colour and flavour' to the field, but are not relevant to this study.

Another area of interest in CMC is that of linguists studying the peculiar position of the language of computer conferences which falls somewhere between speech and writing (Murray, 1988; Holmes, 1987). For example, Baron (1984) explores the ways in which the use of CMC might influence both written language and speech. What is of more concern for this study is her analysis of the linguistic variables and social effects of computer conferencing. She discusses the preponderance of arguments and 'flaming', the difficulties of conveying 'soft' or subjective data and the effects of greater concentration on the message, all of which have been observed by practitioners in the field.

	Potential Advantages	Potential Disadvantages
Spatial Distancing	• anonymity • social equalizer • reduced distractions • increased importance of logical argument	• reduced feedback (loss of communicative nuance) • social distancing
Temporal Distancing	• opportunity to contemplate message, response • opportunity to reformulate correct both production and response • physical convenience	• writer's block conditions (no impetus from inter-locutor to continue) • reduction of language as a means of phatic communication

Table 3.1: Advantages and Disadvantages of Spatial and Temporal Distancing

Baron's categorisation of the advantages and disadvantages of spatial and temporal distancing which is such a dominant feature of the experience of

computer conferencing provides a useful framework on which to build a presentation of user reactions to the medium in Chapter Five.

Applications

For a field which is not much over 10 years old, the number of computer conferencing applications described in the literature is impressive. Studies range from single isolated experiments (Phillips *et al*, 1988; Upton, 1987; Gray, 1989 and many others) to long term, wide ranging analyses using rigorous, replicable methods. One of the most notable studies in the latter category is that carried out at the Institute for the Future and set out in five volumes (see Vallee *et al*, 1974, 1975, 1978, Johansen *et al*, 1978).

Though published in the late 1970's, these volumes remain the only detailed study of conferencing on a relatively large scale (500 users). The predominant perspective of the Institute's work is toward the social and psychological factors of participation in computer conferencing, and the conclusions which can be drawn from these for the enhancement of their conferencing system, FORUM. Furthermore, the users on which this work is based are for the most part, businessmen or business-oriented researchers, who spent varying lengths of time on the system with varying aims and objectives. Nevertheless, the long term, detailed nature of the study with large numbers of users renders much of the data and some of the conclusions an important source of comparison material for this study. References will be made to this work as appropriate, particularly in Chapter Five. For example, their data on reasons for non-use of the system, on the relationship between pre-use attitudes and experience to eventual take-up of the medium, and rates and nature of participation across a large population of users over a long period will all be compared to the Open University experience. In this way, a contribution will be made to building up basic data on user reactions to computer conferencing in different situations, and to understanding the fundamental determinants of interaction and

participation. The work of the Institute is also relevant to this study in the methodology used in conducting the research. This subject forms the basis of the following chapter; however, it is mentioned here to highlight the fact that despite a different orientation to the research and a different kind of user, the OU study will still build on and extend the pioneering work of the Institute.

The prodigious output of Roxanne Hiltz over the last 10 years has, more than all the other research in the field combined, laid the foundations for the study of computer-mediated communication. Her methodology of multiple sources of data rigorously cross-checked for validity has identified the major issues in the field and her data provides a base for comparison and replication. Her case-study of scientific research groups, *Online Communities* (Hiltz, 1984), has much in common with this Open University case study both in methodology and in research findings on user behaviour patterns. For example, one of her main findings in this research is that the strongest predictor of level of use is the participant's own estimate of the time that will be spent online, before ever using the system. This relationship between pre-use attitudes and subsequent take-up of the medium will be investigated in the OU study. Hiltz breaks down the constituents of any use of computer conferencing into the following attributes:

- nature of the task
- size and social organisation of the online community
- leadership effort and style
- any special software features of the system
- differences in initial attitudes and prevailing norms of the group

These determining features provide a framework at the end of the chapter for the development of a tool for analysing this and other applications of computer conferencing in a wide variety of contexts. Finally, her discussion of

the determinants of success in a conferencing application is pertinent to the research question of this study:

> There are many ways of measuring the success of a computerized conferencing effort for the members of a user group. We might have gathered a behavioral measure consisting of the extent to which the members felt so strongly about the value of the system that they actively proselytized to bring new members onto the system. We might have counted the total volume of material they created and read. We will use two measures of 'success' of the operational trials activities for group members. One is the proportion of group members who spent enough hours online that one can presume that they were participating in some activity that they felt to be valuable. The second is subjective ratings of the productiveness or value of the system by those who used it fairly actively. (p 72-3)

Methods of defining and determining the success of a particular implementation of computer conferencing will be developed throughout this chapter. Hiltz has chosen two simple measures of success in this example, one quantitative and one qualitative. Although she addresses a wide range of issues in the book - the nature of the conferencing tasks, the enabling and limiting factors of the conferencing system and the characteristics of the users in relation to the task and the medium, she does not include these factors as determinants of success.

DIVISION 2: SOCIO-PSYCHOLOGICAL - ORGANISATIONAL - EDUCATIONAL

Socio-Psychological Research

Researchers at Carnegie-Mellon University are the main contributors to this aspect of the conferencing literature. Kiesler, Siegel and McGuire (1984) have studied the issues of time and information processing pressures, the absence of regulating communication feedback, dramaturgical weaknesses, reduced status and social position cues, computing norms and etiquette, communication efficiency, participation, group choice and interpersonal behaviour. Physiological arousal, emotional state and expressive behaviour have also been studied in various communication modes (McGuire, Kiesler, and Siegel, 1986 and Kiesler, Zubrow, Moses and Geller, 1984). These issues will be referred to where they have effects on the learning environment (mainly Chapters Five and Six).

Organisational Applications

A number of works (Rice, 1984a and 1987; Hacker, 1986 and Palme, 1981a and b) relate to the impact and use of CMC in organisations. Since the Open University could be described loosely as an information processing organisation, and since one of the three areas of concern in this study is the course team, some aspects of the literature on the effects of CMC on organisational behaviour would appear to be important. This Open University study, however, is not concerned with the general use of CMC at the University, and the course team, despite a number of attempts, did not use CoSy for communication amongst members, nor for preparation of course materials. The impact of CMC was largely felt on the course team when students began to interact with those members who used CoSy. This is when

the issues of hierarchy and chit-chat began to be raised. The case study by Zuboff (1988) of the DrugCorp implementation of computer conferencing is an organisational application which is relevant, however, as she analyses the issue of hierarchy and what she calls, the 'textualization of sociality'. In the DrugCorp experience, employees used their Computer Coffee Break conference to fulfill many of the functions of face-to-face social breaks - chatting, humour, complaints about work and a place to 'blow off steam'. When print-outs of the conference were circulated amongst managers, it became known that participation in this conference was considered a sign of 'nonproductivity' and a 'negative element' in performance evaluations. Zuboff concludes that the management did not appreciate the social and emotional needs of people to communicate, and that the conference participants did not realise the consequences of the textualising power of the medium. These issues will be referred to again in the light of the OU experience. In the halcyon days of Drugcorp's early use of conferencing, users report many of the same advantages as OU students:

> ...the mastery of one's subject area and the ability to share knowledge effectively became recognized as new sources of power and influence. DIALOG's participants built reputations based on the quality of their messages and their helpfulness in sharing information. People became known as experts in their subject areas based on the content of their contributions, and less attention was paid to their formal job designation. (p.371)

This kind of feedback will be echoed in the OU study. In addition, Zuboff's report of the value of 'lurking' will be replicated by quotations from OU students:

> Many of these benefits appeared to accrue even to those who tended to read messages more often than they wrote them. These participants used the conferences as a way to increase their familiarity with a wide

range of subjects and to learn from 'watching how others' minds work.' (p 368)

Rice (1987) adds another perspective to the evaluation of CMC, and simultaneously relates a whole body of literature from a different field: the adoption of innovations. He looks at CMC both as an innovation which impacts on organisations and as a medium for organisations to transmit information about innovations:

> Computer-mediated communication systems not only process information about innovation but are also an innovation that organisations must process, a circumstance that provides organisations with opportunities and challenges for enhancing their resourcefulness and responsiveness. (p 65)

The focus of the OU study is certainly on the impact of computer conferencing at the University, but not specifically on its impact as an innovation. It is the educational value and implementation which motivates this study, not the fact that 1988 saw the adoption of a new teaching medium at the Open University.

Educational Applications

Despite the ways in which the above works are relevant to this case study, the fact that the participants in the OU application were students all studying a specific course in a set time period, distinguishes this case study from all those discussed so far. Although pre- and post-use attitudes may be similar, as well as some experiences of use and non-use, students using conferencing undoubtedly have a different motivation and purpose from employees of an organisation or communities of researchers. Fortunately, there are many educational applications of computer conferencing on which to base this study, and the types of implementation and the disciplines represented are varied.

There are a number of ways of categorising these numerous educational applications; for example:

- the degree to which the computer conference 'delivers' the course material

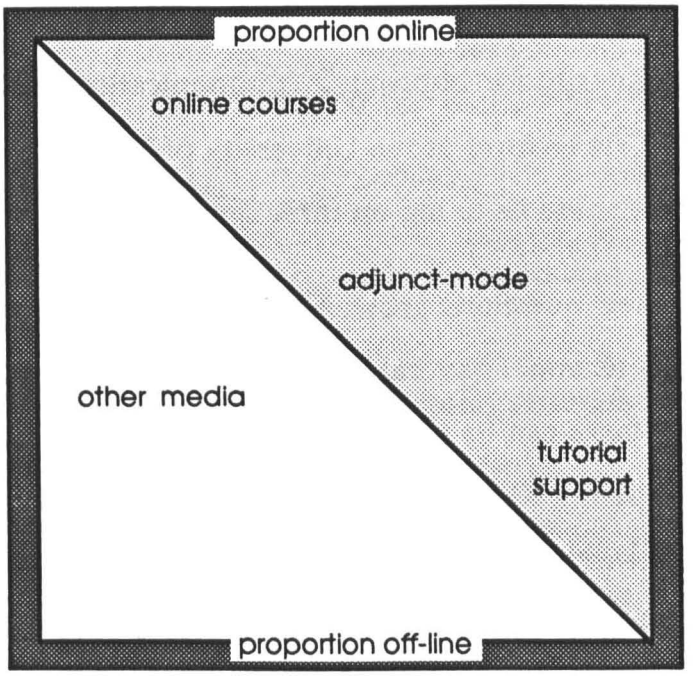


Figure 3.2: Proportion of the Online Element of a Course

Online courses at the Ontario Institute for Studies in Education (OISE) and Connected Education are delivered more or less entirely through computer conferencing and so these two applications would be at the top right of Figure 3.2. Students are sent hardcopy of assigned readings, a course guide and a conferencing manual, but otherwise, the content of the course is conveyed in the discussions, guest lectures and cooperative work carried out online. Students of Connected Education in most cases never meet either the teacher or each other.

Another method of using computer conferencing is in 'adjunct mode', that is, with some part of a course handled online. This method has been used at the New Jersey Institute of Technology, Upsala College and Bath University, U.K. In the first of these, students simulated a year's operation of a company; in the second, writing assignments were presented and critiqued online, and in the

last, one of the assigned readings in the course was discussed online. The remainder of the course was carried out in the usual manner with face-to-face meetings, lectures, seminars, and through readings and assignments.

Finally, computer conferencing has been used for tutorial support at a number of institutions, primarily for improving communication between students and teacher or tutor. One lecturer at the University of Michigan keeps online office hours and requires students to log on three times a week:

> Students get their questions answered quickly because Mr Meisler logs on to his own terminal several times a day. Assignments and other administrative tasks can be taken care of in this way, allowing class time to be better spent. Computer conferencing also allows students to influence the structure of the course. If a large number of people object to an assignment, Mr. Meisler sometimes offers alternatives. He finds the method allows him to 'talk' with students who would normally shy away from asking questions in class, or from visiting during office hours. (Hosley, 1987: 18)

The New York Institute of Technology also uses computer conferencing in its distance education programme to increase student contact with teachers. As this institution has a 'rolling enrollment', the opportunities for students to discuss course issues with other students are limited. Nevertheless, many advantages are reported for remote students (Richards, 1987): asking questions, submitting homework assignments, 'meeting' other students, reading notes and exchanging information. The Open University implementation is, in some respects, similar to this use; the major difference being that when all students begin and end the course together, and are all studying the same course, the opportunities for discussion, for expanding and enlivening the course material and for peer work, advice and support are vastly increased. In general, however, available data from this end of the scale in Figure 3.2 will be valuable for comparison and contrast with the Open University experience.

- the nature of the institution which offers the conferencing course

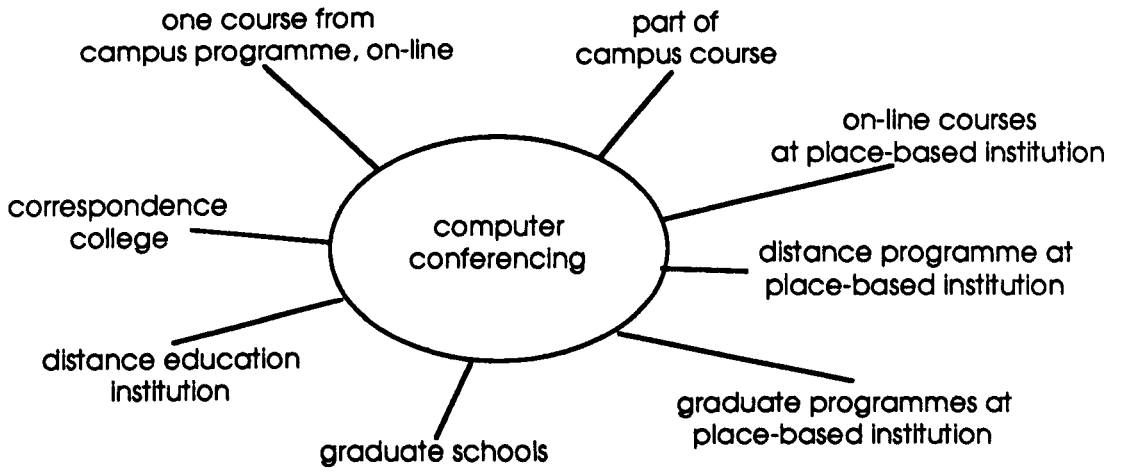


Figure 3.3: Institutional Use of Conferencing

There are a number of educational conferencing applications which involve students not following degree-oriented, tertiary level programmes: for example, Owen (1989), Levin *et al* (1988), and Goldberg (1988). These applications will not be considered here, as the needs and orientation of older students embarked on a university degree, and the objectives and constraints of institutions which offer such programmes are significantly distinct from other educational programmes and levels. As Figure 3.3 indicates, however, there are a number of ways in which degree-oriented, tertiary education is offered online.

Several place-based universities have offered courses, online or partly online, as part of the normal curriculum. These applications often allow researchers to set up matched groups of students taking the same course using traditional methods and using electronic communication. One example of this type is described in Quinn *et al* (1983):

> The course grades obtained by students in the two groups were compared. The scores on a course examination given to all students at the end of the third week showed no significant differences between the

electronic message discussion group and the face-to-face discussion group. (p 316)

Useful as this sort of data undoubtedly is, this situation does not apply in the OU case, and consequently, this type of analysis will not be possible.

Some institutions which are primarily place-based have experimented with conferencing for providing courses online, either to offer greater flexibility for campus students or for developing a distance education programme. The extent of these examples begins to show the blurring and convergence of traditional distinctions between distance and place-based educational institutions. The University of Manitoba, for instance, is using a computer-aided personalized system of instruction (CAPSI), including electronic mail for both on-campus and off-campus teaching (Kinser and Pear, 1988). Guelph University has conducted a number of experiments in many areas of the curriculum using its own CoSy system (Cadsby, 1985; McCreary and Van Duren, 1987, and Moore, 1987). The Rochester Institute of Technology offers courses or parts of courses online using VaxNotes, as part of its aim to create a barrier-free learning environment for students with disabilities (Coombs, 1989). The Division of University Extension at the University of Victoria (BC) has used email in conjunction with electronic transfer of data files to turn their campus based programme on Computer Based Information Systems into a distance education program (Muzio, 1989). Waterloo University (Black *et al.*,1988), University of Alberta (Carney and Archer, 1988), Deakin University (a dual purpose institution, Castro, 1988b), and the Universities of Massachusetts (Hellerstein, 1986), Michigan (Heydinger, 1978) and Alaska's Fairbanks (Scollon, 1981 and Riedl, 1989) are all primarily place-based institutions which have used computer conferencing or email to augment their usual methods of course delivery.

Graduate schools and programmes are also finding computer conferencing a valuable tool for providing time and distance independence for older students,

and also for the kind of discussion, analysis and criticism expected of graduate level education. McCreary and Van Duren (1987) have noted that:

> the distribution curve of student participation tends to change with advancing academic level...With early undergraduate conferences the majority of students are likely to be read-only participants, while a small proportion add one comment or question, and an even smaller number become actively involved. For more senior student populations where faculty expectations are higher, course evaluations encourage demonstration of individual creativity, and student dialogue is part of the learning process, the rate of participation more nearly resembles a normal distribution. The majority of students will be likely to contribute regularly, while the exceptions are read-only or intensely involved. (p 112)

Graduate students at the University of Strathclyde have used computer conferencing on a local area network to produce an electronic journal (Baird *et al.*, 1987), and Saunders and Heyl (1988) describe a two year graduate-level, professional health care programme which drew together electronically students from six major western universities.

In many respects, computer conferencing seems to have most to offer distance education institutions with their isolated and dispersed students and their faculty cut off from contact with students:

> The less opportunity there is for frequent personal interaction and the more opportunity there is for easy computer access, the greater will be the educational value-added of computer conferencing.(Cadsby, 1985: 9)

In fact a good number of distance teaching universities are implementing or considering the options for implementing some form of computer-mediated communication. Even some correspondence colleges are now exploiting the possibilities inherent in CMC for administrative, supportive and informative

communication with dispersed students. Examples of these include Athabasca University (Van Duren, 1989), Empire State College (Roberts, 1988), the NKI College of Computer Science in Norway (Paulsen, 1989), and the Jutland Open University in Denmark (Lorentsen, 1989). In some cases, the contact and two-way interaction which computer conferencing provides have allowed distance education institutions their first opportunity to offer their students an educational experience similar to campus-based institutions:

> CMC has tremendous potential in creating impromptu tutorials and this course has been the first one to make me feel that the OU has a campus like the conventional Universities. (OU student quoted in Mason and Kaye, 1989: v)

By looking at the present applications of computer conferencing in the light of the type of institution adopting this technology, evidence is amassed in favour of the convergence hypothesis, and the contribution which CMC is making to it.

- the degree to which conferencing has been adopted by the educational institution

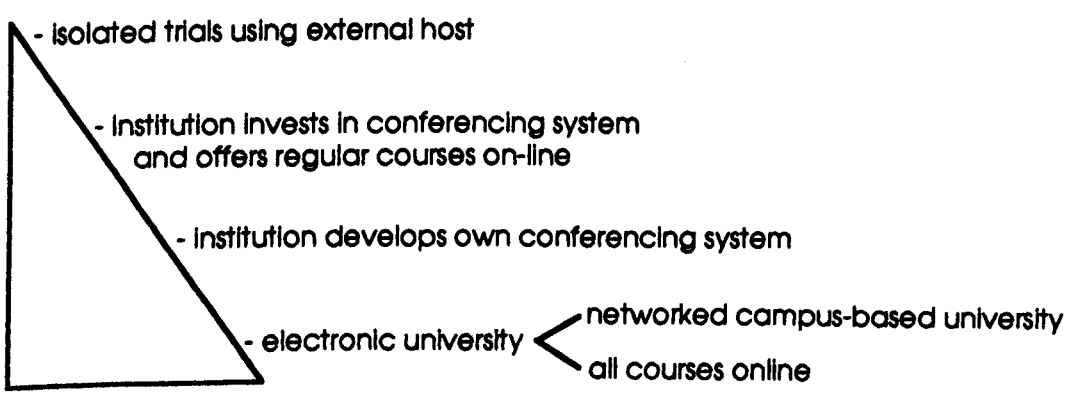


Figure 3.4: Degree of Institutional Adoption

The kind of categorisation shown in Figure 3.4 is probably the least satisfactory in that it is highly time-specific. The CMC technology is itself a moving target, as new systems are developed (Alexander and Lincoln, 1989), significant

improvements are made to existing software (Turoff, 1987) and new concepts in computer conferencing are being created (Taylor *et al*, 1987; Davies, 1989). Furthermore, many institutions begin with small applications and allow use to spread as more faculty become interested and student demand rises. Nevertheless, it is useful to look at the ways in which various educational institutions have adopted computer conferencing, as this can further refine and locate the Open University case study within the context of current models.

A number of institutions have tested the electronic waters very cautiously by arranging to use an external host system and by experimenting with a small group of students. Bath University borrowed space on the OU's CoSy to run a small trial (McConnell, 1987) and the Southampton Institute for Higher Education uses CAUCUS, supplied by the Times Network Systems to host a course for teachers and lecturers (Gray, 1989).

Other institutions, the OU and the University of Arizona for instance, made extensive investigations and 'feasibility studies' and then invested in a conferencing system in order to offer regular courses online (Kaye, 1985 and Caldwell *et al*, 1987). Most of the educational institutions mentioned above fall into this category.

A few universities have developed their own conferencing system: EIES at the New Jersey Institute of Technology, CONFER at the University of Michigan, and CoSy at Guelph. These centres tend to have used conferencing longer and more extensively than other sites.

The concept of an electronic university is often used, but not often fully realized. The Electronic Network offers only email contact with the lecturer, and various other schemes have yet to materialise (SUNY, 1985, The Global Electronic University, Utsumi *et al*, 1988). Connected Education is perhaps the first and most fully fledged example of an electronic university. It provides

degree-level and graduate-level courses, as part of the offerings of the New School for Social Research in Manhattan. Apart from reading recommended texts, all learning activities involve communication via the conferencing system, EIES; there are no face-to-face meetings and no printed texts sent through the post. Students are expected to spend about 30 hours online for a three credit course, but to prepare all messages and assignments off-line. Similarly, they are advised to download and print out the basic course material from the 'read-only' conference, where the instructor has put documents and commentary. Daily participation in the main conference is encouraged; to obtain a passing grade, each student must input a minimum of two messages per week. In practice students often send several messages a day. Mid-term and final examinations are also, of course delivered online. The director, Paul Levinson (1986) says:

> During the two months in which our courses are conducted, students can read and retrieve material entered by faculty and other students, as well as ask questions of their own, any time of their choosing, night or day. Students in addition can communicate with faculty through private message systems, and there are facilities for 'live', real-time exchanges between faculty and students. The result is a very stimulating intellectual environment, described by our students as akin to 'top-notch seminars' and superior to most of the 'in-person' courses they have previously taken. (p 144)

Another way in which the term 'electronic university' is used involves the networking of place-based institutions so that all campus students have easy access to the mainframe computer for storage of files, work on programmes and conferencing activity. A number of universities in North America are some way along the route to offering their students this kind of education. In the U.K., initiatives are underway at Bradford University, at Aston University

and at Cambridge - the latter to network the whole town via the underground water system.

DIVISION 3: PLACE-BASED AND DISTANCE EDUCATION

Despite the extensive evidence described above, indicating how computer conferencing tends to blur differences between place-based and distance education institutions, there are many ways in which these two kinds of institutions still differ. For example, it still remains the case that many distance learners feel very isolated as learners and are strongly motivated to make contact with their teachers and fellow students, and most on-campus students at the present are still younger and less experienced than distance learners. These factors make applications of computer conferencing in place-based and distance education institutions sufficiently distinct to warrant separate evaluation.

Place-based institutions

The most extensive study of computer conferencing at a place-based institution is the Virtual Classroom project of Roxanne Hiltz at the New Jersey Institute of Technology. A major goal of her work has been to determine the exchangeability of the outcomes of student experiences using computer conferencing with those obtained in the traditional classroom. As indicated above, comparisons between students using and not using conferencing were not possible in the OU situation; furthermore, Hiltz is comparing use of conferencing with campus-based education, not with distance education. Her secondary goals are, however, of greater concern to this OU study:

> to identify characteristics of students and of online interaction which are associated with the most successful outcomes for the virtual classroom environment. (Hiltz, 1987: 2)

To be able to identify agreed criteria of success in computer conferencing applications is a useful goal of evaluation studies. A legitimate question put both by laymen and experts of any implementation of computer conferencing is surely: Does it work - was it successful? This study will contribute to the establishment of criteria for answering this question, though not as Hiltz does, in relation to the characteristics of students or the online interaction. Although qualitative data from the lecturers who taught the courses which used conferencing is included in Hiltz's reports, her three components of success are student-based:

- amount and type of use, as measured by total hours of connect time, number of logins, number of messages input, number of mail messages sent and number of different addressees to whom they were sent
- subjective satisfaction, assessed through post-use questionnaires to students
- effectiveness of learning, as determined by examination scores of matched courses, online and face-to-face.

It is the assumption of this OU case study that the point of view of students must be assessed alongside that of teachers and the institution generally in defining criteria for success of an application of computer conferencing. For this reason, a wider set of criteria, involving tutor and course team perspectives will be proposed in this study.

In referring to the research showing that the medium chosen for teaching does not affect educational outcomes, Hiltz concludes that research on computer conferencing should identify implementations which capitalise on its strengths and minimise or circumvent its weaknesses. The question of assessing the effectiveness of the OU application will also be addressed in this study.

Hiltz's methodology, to be discussed in the next chapter, and some of the results from her data, to be referred to in Chapter Five will provide even further links with this OU study. Nevertheless, Hiltz's students were young undergraduates accessing EIES largely from dumb terminals in various locations on campus. OU students are not only mature working adults, but were all equipped with workstations in their homes. Furthermore, they had very few opportunities for contact with other students, tutors or members of central OU staff.

Distance Education

The Centre for Distance Learning of Empire State College normally teaches through tutored independent study. In order to provide the advantages of group interaction to their students whose sole contact is otherwise through their tutor, the College decided to experiment with an American Diplomacy course offered on CAUCUS (Roberts, 1988). As this course was merely adapted from an existing distance course, Roberts was able to observe:

> Compared with the performance of previous classes, the written work submitted by this class appeared to be superior, both as to breadth of research and quality of analysis. . . Students do use the conference to test out ideas on the class that later appear in developed form in their papers. (p 36)

Based on his experience of teaching this course, both online and off-line, Roberts summarises the advantages which conferencing brings both to distance learning and to face-to-face education:

- it breaks down the isolation of the student from his peers
- it permits the student to benefit from the shared experience of a group engaged in the same study

- it offers students the opportunity to measure their ideas against those of others in the group
- the maintenance of a shared record allows discussion to be summative rather than discrete.

Each of these aspects of conferencing will be investigated in the OU study to determine whether they proved advantageous to students.

Looking at the possibility of convergence between place-based and distance education from a different angle, he poses the question: "Will we continue to maintain the campus classroom as an ideal, if seldom used, model or will we create environments that incorporate the advantages of both classroom and non-classroom learning?" (p 36) Roberts goes on to suggest not only that computer conferencing could hasten the convergence between the two distinct models, but also to imply that it could contribute to the development of a model which is an improvement on either one of them alone.

Roberts gives no details about numbers of students, their equipment or statistics of use; however, the fact that it was a pilot implies a small-scale implementation. Other small trials at distance education institutions have also been reported. For example, Haile (1986) at the New York Institute of Technology has used many of the well established techniques for analysing user statistics and conference messages on eight students spread over six different courses. It is difficult to draw conclusions about the effect of teaching style on student outcomes with such a small sample. Similarly, the reports of the initial stages of the development of a Virtual School at the NKI College of Computer Science in Norway (Paulsen, 1989) can only make tentative statements until student numbers and statistical data build up.

DIVISION 4: SMALL-SCALE - MASS EDUCATIONAL APPLICATION

Small scale use

Many of the reports about applications of computer conferencing suffer from lack of data or small numbers of students enrolled on courses. An exception to this is the work of Harasim at the Ontario Institute for Studies in Education (OISE). Over the last few years, she has built up a systematic descriptive research record of the use of PARTIcipate at the Institute, including data on the distribution of message volume for users, on the percentage of messaging by hour of day and day of the week, and on transcript analysis using 'message mapping' (Harasim, 1989a). Furthermore, she has identified and tested strategies to maximise interaction and participation by students, and used the cooperative learning potential of computer conferencing to develop peer learning opportunities for distance learners.

> User reactions support the statistical analyses that the online medium facilitates active, interactive, and equitable participation. Students rated the online courses as promoting more active and effective learning than either distance or face-to-face mode course delivery. (Harasim and Wolfe, 1988: 4)

Other lecturers at the Institute are now using PARTI and contributing both new implementations and different perspectives to the research base (Davie, 1989). Although student numbers are small (under 20 per course, and often under 10), this kind of analysis, built up over a number of years provides another source of comparative data for this OU study.

As OISE is a graduate school, the students on these courses are working at an educational level which demands more active involvement, discussion and skill in written expression than comparable undergraduate level courses. In

addition, computer conferencing was the main delivery medium of these courses - to study the course, the student needs to login frequently. The degree to which conferencing carries the content of a course accounts in large part for the differences which evaluators report in whether conferencing supports equitable participation or not. In courses which are delivered mostly online, statistics usually show that student participation is not only higher than in face-to-face courses, but is more evenly distributed throughout the group - as Harasim reports above. Where conferencing forms a smaller part of a course, participation tends to be unevenly distributed - as the OU case study will show.

The educational use of computer conferencing when used as the main delivery medium is quite different from its use as a small element in a full credit course. This difference extends well beyond the equitable distribution of participation. The preparation and conception of the course will be different; the role of the online tutor will be different and the motivation of the students will be different. Apart from the aim of giving students practical experience of one aspect of the course content, the OU application of computer conferencing was primarily for tutorial support. The extent to which course content was ever intended to be delivered through conferencing is ambiguous as has been explained in Chapter Two. In any case, the amount of time students were recommended to allow for conferencing activity was a very small proportion of the total. This kind of supportive role for a conferencing system has been used at other distance education institutions: The New York Institute of Technology, the NKI College of Computer Science, and the Jutland Open University. However, these applications are, at the present, small in scale.

Mass distance education application

A search of various databases and numerous literature reviews by experts in the field has shown not a single example of the mass use of computer conferencing. Some business and organisational applications may have large

numbers registered on the system, but many are in fact inactive. Certainly no educational use on a mass scale either at place-based or distance education institutions has been identified. This situation is bound to change soon as the interest in exploiting computer conferencing is growing so rapidly. Consequently, the first introduction of this medium into a distance teaching university on a mass scale adds a new dimension to the present state of its exploitation.

Although there are a number of detailed studies of computer conferencing as the main delivery medium of a course, and a few reports on conferencing in adjunct mode, there is very little data and analysis of applications in the tutorial-support mode. What are the advantages and disadvantages of using computer conferencing in a minor role on a multi-media course? Is it an effective medium for offering distance students tutorial support?

Despite the number and variety of articles now published about computer conferencing, the amount of *research* in the field is quite small. Many of the citations above are descriptions of applications, and in some cases they contain more hyperbole about the potential of the medium than supportable claims and conclusions solidly based on data. The literature contains very few attempts to analyse the content of messages, and even fewer to relate these to educational goals.

This case study will therefore, be the first detailed analysis of an application of computer conferencing for tutorial support in mass distance education. Although it will contribute to the field from this unique perspective, the study will be situated within the context both of the research findings and the methodologies of previous studies of educational applications at place-based and distance education institutions.

RESEARCH QUESTION

As indicated above, it is considered obligatory to address the question of evaluating the success of this implementation of computer conferencing. In the planning stages, scepticism was certainly expressed about whether large numbers of students would be able to surmount the hurdles to logging on, whether the conferencing system would withstand the strain of so many users and whether this could be used as a mass medium. As a case study looking at the first large-scale use of conferencing, this thesis must respond to the simple question - did it work?

As soon as this simple question is 'unpacked', it is seen to contain a multitude of other complex questions:

- What criteria are used to define success?

Criteria of vital importance in some applications are not relevant in others. For instance, the nature and quality of what students learn is fundamental to educational applications, but not relevant to purely social forms of conferencing. The frequency of login and the value and amount of student contribution is more important to courses delivered completely online than to courses using conferencing for tutorial support. Institutions which have a significant commitment to conferencing as a teaching medium must consider the experience and opinions of their many staff members affected by this new mode of working. In very small-scale, or one-off experiments, this is less relevant.

- How is success to be measured or determined?

Quantitative data provides measurable levels of use, but is inadequate for determining less tangible indicators of success. Statistics generated by most conferencing systems on the amount of use, the length of messages and to

whom they were sent, are basic data to any assessment of success in this field. However, because of the ease of collecting this data, and the difficulties of gathering and interpreting qualitative data - from interviews, open-ended answers on questionnaires and process comments in conferences, quantitative data can easily become the focus of evaluation, rather than one element in it. Integrating qualitative and quantitative data is the backbone of the research methodology of this thesis as described in Chapter Four.

- How can assessing success be of benefit to research in this field?

Although the value of assessing the success of a particular application has been discussed as an aim in its own right, the ability to generalise and draw lessons for other practice is equally important. To be able to say at the end of an evaluation, "Yes, it was successful" or "We give it a C minus - could do better", may be useful in certain circumstances, but information on what aspects worked well and what elements caused difficulties, is a far more satisfactory outcome of assessment and provides more usable information than the grading of success on a single scale.

Criteria

The three components of any application - the participants, the purpose, and the medium - are an obvious place to look for criteria of success.

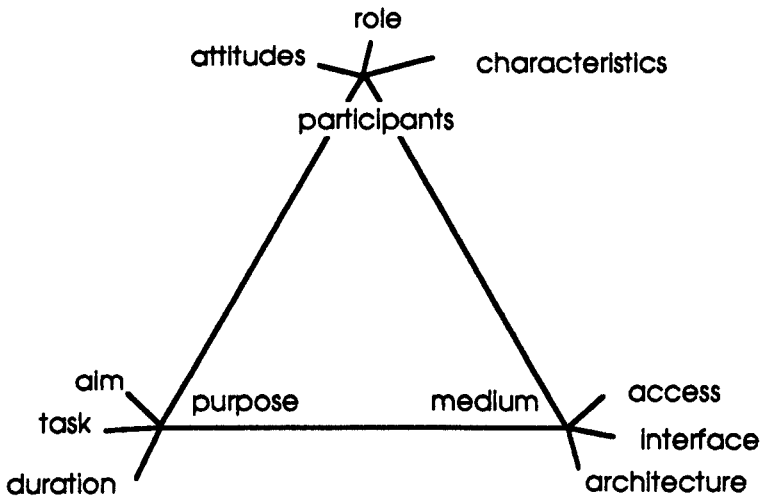


Figure 3.5 Components of a Conferencing Application

Figure 3.5 shows these three elements and their subsidiary components in relation to one another. From these three elements, the following criteria which apply to all implementations can be derived:

- the use which participants make of the system
- the nature and aims of the task
- the effectiveness of the conferencing system in meeting the needs of participants and facilitating the aims of the task.

The interrelations amongst the three points on the triangle provide different emphases for different kinds of applications, and any one element can be seen to mediate between the other two. For instance, the way in which CoSy was structured for students affected the way in which they approached the task. Similarly, the aim of using CoSy on the course strongly influenced students' approach to the medium. Finally, the large number of adult users learning at a distance created a need for an interface to carry out the task.

Measures

There are a number of ways of determining success in this field: comparability of outcomes with other media, quantitative data on user behaviour, reactions

and attitudes of participants, implementors and organisers, and content analysis of messages. The measures to be used in this study will be defined in the next chapter on methodology. One measure which will not be used is 'comparability'. Data comparing conferencing with other media was not available for this application, and in any case, the typical outcomes of comparability studies are not what is being sought in this thesis - for example, that students who used conferencing perform as well on exams as students who met face-to-face; or tutors get more email from students than telephone calls.

Outcome

The question of determining success can be constructively rephrased to indicate those elements in the application which contributed to the positive features of its use, and those elements which contributed to the negative features of its use. Aspects of 'good practice' should be highlighted in this form of evaluation and possible lessons and generalisations more easily extracted. Furthermore, all the vital constituents of a particular application can be included when the question is posed in this way and it does encourage investigation of a wide range of criteria for success.

The research question of this thesis stated in its simple form is: was this application successful? The questions-within-the-question which will be addressed are:

Participants

- Can large numbers of participants use conferencing effectively?

Task

- Is it an effective tutoring medium?

Medium

- Does it work as a minor component of a multi-media course?

Answers to these questions will focus on the elements within the application which have worked well and those which have not. Each question will be posed from the perspective of students, tutors and the course team. Recommendations will be offered for future large-scale applications.

CHAPTER FOUR: METHODOLOGY

SOURCES

Discussions on the methodology of the case study have recently been collected and extended by Merriam (1988) in *Case Study Research in Education.* This work draws together the perspectives of several other major contributors to case study methodology - Guba, Lincoln, Glaser, and Goetz and LeCompte, and sets out the theory and practice of the qualitative approach to case study research. Although published after the majority of fieldwork had already been undertaken for this thesis, Merriam's comprehensive treatment of the issues has nevertheless clarified and supported the approach adopted, and contributed to the data analysis phase.

As mentioned in the previous chapter, the methodology used by a number of studies of computer conferencing, notably those by Hiltz and the Institute for the Future, is also important for comparison and contrast with the approach and results of this case study. Research on applications of computer conferencing has certain forms of data as 'givens' - computer-generated user statistics, a complete record of all conference content, and the potential of easy online survey research. Inevitably there will be considerable similarity in the kind of data that research in this field generates. However, this chapter will show that the approach taken to the research can be very different and the methods used for considering and analysing the data reflect the underlying perspective of the researcher.

THE GREAT DIVIDE

The debate which has raged between researchers of the scientific and naturalistic schools, sometimes stereotyped as quantitative and qualitative research, has moved through a variety of phases from outright hostility to

mutual acceptance and even 'inter-marriage'. The historical sources of the divide and the present attempts to gloss over the differences are documented in Smith (1983) and Smith and Heshusius (1986).

> While the differences between the two approaches originated in the positivism-idealism debate of the late 19th century, contemporary discussions can be further analyzed within the context of scientific realism and idealism. (Smith, 1983: 8)

The basis of scientific realism is that the scientist can stand apart from the subject and observe an independently existing reality, whereas to the idealist, what is investigated is not independent of the process of investigation. According to Smith and Heshusius, the present overtures of cooperation between the two fundamentally different paradigms - by studies which mix quantitative and qualitative research - lead to confusion and ambiguity of method, terminology and outcomes:

> Quantitative inquiry aspires to certitude, to the idea that our descriptions can match actual conditions in the world and that we can know when this matching occurs and when it does not. This certitude is achieved primarily through an adherence to proper techniques. For the qualitative perspective, inquiry is a never-ending process (hermeneutical) of interpreting the interpretations of others. All that can be done is to match descriptions to other descriptions, choosing to honor some as valid because they "make sense", given one's interests and purposes. There is no rule book of procedures to follow. (Smith and Heshusius, 1986: 9)

Guba (1987), however, suggests that method and paradigm can be separated: as long as the basic paradigm of the research is made clear, qualitative and quantitative methods can be combined. The main pitfall to avoid in this 'blending' is any attempt to transform qualitative inquiry into a watered down

version of scientific inquiry. The underlying paradigm of this case study is that of the interpretative, naturalistic philosophy. Quantitative data will be used in triangulation with other data to enhance validity and reliability. Qualitative data will be used to understand and interpret in a process of moving between the part and the whole. Though it uses rigorous and systematic methods, this work will not seek certainty and proof as end results. The considerable amount of quantitative data available on this study will be used not to measure and predict, but to strengthen and confirm insights and observations gained from naturalistic methods of data collection.

CASE STUDY RESEARCH

Appropriateness

This thesis conforms solidly with Merriam's (1988) definition of a qualitative case study: "an intensive, holistic description and analysis of a single entity, phenomenon, or social unit" (p 16). An underlying assumption of case study research is that the particular unit is a legitimate field of study in its own right (Walker, 1980). As Chapter Three demonstrated, this thesis is one of the first to research the use of educational computer conferencing on a large scale. The case study method is particularly suited to research in a new area, as it contributes to the knowledge base and practical foundations of the field. It is also useful when a more holistic view of educational outcomes is sought:

> Case study research, and in particular qualitative case study, is an ideal design for understanding and interpreting observations of educational phenomena. (Merriam, 1988: 2)

Furthermore, qualitative case studies are predisposed to building theory, using inductive rather than deductive modes of thinking and analysis of data, and hence are more appropriate in a new field where testable theories do not yet

exist. Referring specifically to the use of case study methodology in CMC research, Rice (1984b) says:

> It is entirely appropriate and necessary for evaluations of new media to consist of or to include case studies. Critics of this approach argue that the results, which are rich in process and contingency analysis, cannot be generalized to other instances of new media use. In reply, it can be said that we have as yet little understanding of the process by which individuals and organizations adopt, use and respond to communication systems, so that work needs to be done to establish the range of possibilities, identify problems with variable definition and data collection, develop standards for later comparison, and develop theory that can be tested in subsequent replications. (p 57)

Marton (1981) labels this kind of descriptive, experiential and contextual research as 'phenomonography', and argues that it is complementary to other kinds of research, which aim to make statements about the world.

This case study also exemplifies Merriam's four defining characteristics of qualitative case studies:

- particularistic - This case study looks at the defining characteristics of the first presentation of DT200. Subsequent presentations of the course will have more experienced tutors, a modified version of the interface and training materials, and a course maintenance team rather than a course creation team. Not only is this study specific to the OU context as outlined in Chapter Two, but it is also focussed on the 1988 presentation. Evidence from the 1989 use is already showing substantial differences.

- descriptive - The presentation of data on this case study will be richly descriptive, so that the quality of the whole experience is recreated for the reader. The considerable amount of data available from the 1988 presentation from a variety of sources and in a number of different forms

lends itself to a detailed and wide-ranging picture of the event. The nature of this kind of description is "experiential, qualitative, content-oriented and interpretative. The individual's world and not the individual himself is 'thematized' and described". (Marton, 1981: 189)

- heuristic - Due to the multiple perspectives of those concerned with the use of CoSy at the OU in 1988 - the students, tutors, course team, academic computing service, the administration and management of the University, and other faculties interested in using CoSy, the heuristic approach of this case study is particularly appropriate. Thus, from the discovery of relationships and variables in this complex web of interdependence, plausible generalisations, rather than definitive conclusions, will be made.

- inductive - Given the largely unknown nature of how computer conferencing would work on such a large scale undertaking, the method of allowing hypotheses, concepts and generalisations to emerge from the study was much more satisfactory than attempting to impose these at the outset. The fact that conferencing behaviour turned out to be quite different from what was anticipated shows that a deductive approach to analysis could have missed the most important results of the application. The methodology of this thesis reflects the fact that the research parameters could not be controlled from the outset, but evolved with the action taking place.

DATA COLLECTION

Data for this case study was collected in four different ways: from interviews, from observation of students, tutors and the course team, from a variety of documents, and from statistical analysis of surveys, the student database, and computer-generated usage data. Analysis of the data was very much an on-going process and changed and developed as the data became available. The

rest of this section explores the nature of each of these four data sources and explains the strengths and limitations of the various methods and results.

Interviews

Hiltz's (1984) findings that pre-use attitudes and expectations are the strongest predictors of take-up of computer conferencing, largely influenced the interview schedule of this research. Twelve tutors of varying experience and computer expertise were interviewed before the course began, and 15 students from the two tutor groups which were selected for in depth study were also interviewed before they had any experience of CoSy. These students were interviewed again about mid-way through the course when use of CoSy was at its height. Although this was not a strict replication of Hiltz's original findings, the purpose of these interviews was to determine pre-use attitudes and to compare these with subsequent use at a later interview.

These interviews began as semi-structured - that is, a set of questions or issues were put to the interviewee, but the wording and format developed from the situation. Although it is impossible to escape the human factor in an interview, the role of the interviewer was seen in these early interviews to be neutral, nonjudgemental and above all, non-participatory. Students and tutors were asked questions from three areas: their educational and computer background, their attitudes to teaching and learning, and their expectations about using CoSy. All interviews were recorded in the interviewee's home and later transcribed. It was discovered after the first few interviews that the richest comments were evoked after the tape was turned off and the interviewer felt free to reveal personal views and conferencing experience to students and tutors. As interviewees had so little conception of what conferencing might be like, their answers to anything but factual questions were largely uninformative. Gradually a new strategy of interviewing took shape, where the interviewer contributed more personal content to the

interview in an attempt to unlock hidden assumptions of the interviewee. This resulted in more satisfactory interviews primarily because it drew out a number of issues which could be built on in the later interview. The second round of interviews with students covered their actual use of CoSy (and they were referred back to what they had predicted in the earlier interview), their views on its value and limitations, and any problems they had encountered in use. As the interviewees now had first-hand experience and opinions, the interview consisted primarily of efforts to draw these out. Nevertheless, the interviewer continued to find that occasional participation led to richer detail and more spontaneous revelations from the interviewees. For example, when asked to describe difficulties in learning to use CoSy, or to draw a picture of their conceptual understanding of its structure, interviewees gave much more detail, if the interviewer admitted to various misconceptions or revealed the problems other students were having. When the interviewer described the initial idea for this thesis (whether computer conferencing could increase students' self-directedness in learning) at the end of an interview with a tutor, he spontaneously revealed that his purpose in tutoring the course was to see whether CoSy could be used to encourage peer teaching and peer evaluation. This made a strong basis for follow up at the next interview.

From the nearly 50 interviews (including those of course team members), a perception and understanding of different perspectives was gained, which guided and underpinned the rest of the investigation. Certainly the amount of factual detail emerging was very small, but the grounding they provided by seeing users in their own setting, emeshed in their particular domestic arrangements, and the immediacy of unraveling the perspective of so many individual participants, undoubtedly provided the strongest impact of all the data gathered for this study. Any conclusions from statistical analysis, or generalisations made by others could immediately be grounded by 'applying' them to specific people to see whether they had an air of authenticity. Any tendency to exaggerate the benefits of the medium was easy to dispel by the

strong impression students gave of the difficulties and hesitations they had about using conferencing. The number and variety of people interviewed showed the complexity of issues involved in the use of this medium, and thus acted as a force against simple categorisation of results.

Two tutor groups were chosen to be followed in depth - one had a tutor experienced in moderating conferences, and the other had a tutor with no OU tutoring experience at all. The 15 students selected from these groups for interviewing - simply because a convenient interview schedule could be arranged - all turned out to be medium to low users of CoSy. When this became apparent half way through the course, a special study of the Scottish region was made, through telephone interviews, specially arranged discussions, tutorials and interviews with very high and low users of the system. Although the sample interviewed was never intended to be representative, the interviewer felt towards the end of the course that enough qualitative data had been gathered by means of this method to begin analysis and triangulation with the quantitative data which was beginning to be available from various questionnaire surveys.

Participant Observation

While interviewing gives a secondhand account of actual experience, observing as a participant gives firsthand experience of the event being studied. In terms of this study, participant observation took a variety of forms: students were observed over-the-shoulder as they attempted various procedures on CoSy, and tutorial and self-help group meetings were attended (particularly in the two tutor groups being most closely monitored). In

addition, full participation in course team meetings and in the preparation of course materials was an integral part of the research methodology[1].

Observing students using CoSy was very instructive for understanding the perceptions of the naive user and for appreciating the hurdle that contributing to a national conference represents to many students. Attending tutorials added the perspective of students and tutors interacting in a face-to-face group, as well as a wide range of student opinion on the course as a whole. Records were kept of procedures students used, the commands they tried, and their actions and reactions when 'stuck'. Similarly, the behaviour of students during tutorials was noted, as well as the nature of questions asked and who asked them.

By far the most significant use of the method, however, was the regular participation over two years in the course team meetings and other subsidiary working groups. The data gathered from this experience provides the primary material for the discussion in Chapter Seven on the impact of computer conferencing on the course team. Notes were made of comments revealing different attitudes to the medium and of activities revealing a change in attitude or use of the medium. Including this element in the analysis of the success of this implementation is regarded as essential to the holistic nature of the study. As Chapter Two made clear, the course team is a fundamental linchpin in the OU system. If conferencing does not 'work' for the course team, its future at the OU is clearly limited. Although the aim was to observe as well as to participate, it must be admitted that many of the imperceptibly slow changes in attitude of course team members were not adequately

---

[1]I joined the course team in September 1986, after the decision to use CoSy on the course had already been taken. I was co-author of the teaching material on computer conferencing - Block 2 Part D, which presents the medium to students and trains them in its use. In addition I was author/co-ordinator of the project questionnaire, which provides the database of user reactions to CoSy. After the course began, my on-line involvement included extensive email exchanges with students, contributions to national and local conferences and sharing responsibility for the Coco ID, where students could send their queries about the course.

observed and documented with the result that the gradual 'take-over' of the conferencing element of the course from a very minor place in the thinking and strategy of the course team to by far the most significant and important aspect of the course is not as well substantiated as it might have been with a more skilled practitioner of participant observation. Nevertheless, the insights gained from being a practising member of the course team, and thereby feeling the issues as a course writer, have largely contributed to the realisation that the perspective of the course team is as valid and important as that of the students and tutors. The presentation of the course team perspective, however, is biased towards a sympathetic approach to their enthusiasms and dilemmas.

Interpretation of Documents

A number of important documents about the use of CoSy on DT200 have been studied for this thesis. First of all, the minutes of all course team meetings and subsidiary groups - Practical Work Group, the Tutorial Provision Group and the Project Work Group - will be used in conjunction with the notes and recollections of the participant observation. These are important for determining the aims and objectives of the use of CoSy on the course as well as the hidden assumptions and underlying expectations of course team members. Secondly, a number of papers about the use of CoSy in 1988 have been written (Thomas, 1989; Castro, 1988; Welford, 1988; Brown, 1988), and all of these give individual perspectives which will be referred to as appropriate.

By far the most important 'document' for this analysis is the content of all of the conferences of the 1988 usage: 65 tutor group conferences and 6 national conferences. These have all been retained on floppy disks and one topic (gremlins, consisting of 500 messages) has been transferred into a HyperCard stack and given keywords for purposes of content analysis. It is the major contention of the methodology of this thesis that too little attention has been paid in research and writings about computer conferencing to the actual

content of messages. Many laudable studies have been carried out based on the user statistics generated from conferencing applications. These include network analysis, the timing and duration of use, the use of specific commands or sequences of commands, the use of categories of messages (private, public, single-multiple), interaction patterns among senders and receivers, and message maps of conferences. However, one usually looks in vain for any relation between this kind of analysis and an evaluation of the actual content of messages. In fact, most computer conferencing literature distinctly avoids making anything but very general statements about the content of messages. Without an understanding and evaluation of the quality of conference interchanges, all the quantified linkages between and about participants are lacking in substance.

In keeping with the naturalistic methods preferred throughout this thesis, the categorising, quantifying, and typologising of messages will be carried out without divorce from the quality of the content. The considerable effort involved in assigning keywords to 500 help messages and manipulating them in HyperCard, though useful for other reasons, did not lead to the kind of evaluation sought in this thesis. Indeed, it proved how misleading keyword categorising can be. For example, messages which use the keyword - modem - but in no way contribute to the discussion are all assigned the modem descriptor. The results then show that there were 37 messages discussing modems, and the reader easily imagines a scintillating discussion, which may in fact have consisted of queries never responded to, turgid descriptions which no one ever read, jokes, specific exchanges between two participants which were more appropriate for email and so on. The method used for this thesis is a thorough reading and rereading of all conference messages in the light of all the other data available. The result will inevitably be personal, subjective and interpretative, but it will be presented so that the reader can see its context and judge its merits. Parlett and Dearden (1977) provide support for this form of evaluation:

> First, it can be said...that dealing with numbers is no safeguard in itself against gross bias or partiality on the part of the investigator. Indeed, personal judgment is required even in the most "objective" study, eg. which tests should be used, which item analyses should be done, and most particularly, how should the results be presented and summarized. Often these judgments, and the reasons for them, are open to no more than cursory inspection for readers of reports. It is not usually the case either that wholly quantitative educational researchers present all their raw data; summary tables are often no more "publicly verifiable" than are the summaries of qualitative studies. (p 38)

What is lost in reliability and objectification, is gained in tackling more complex questions - in this case, what was the educational value of the interchanges on CoSy in 1988.

Quantitative Data

A considerable amount of quantitative data was available from the 1988 presentation of DT200. The Institute of Educational Technology carries out surveys of new courses in their first year, and a special evaluation was carried out by the department of those courses using the Home Computing Policy. The surveys carried out by Bates (1989) were valuable for setting the conferencing element of the course within the context of the course as a whole, while those by Kirkwood (1989) set it within the context of the other computing elements of the course.

Considerable effort was required to obtain computer-generated user statistics as CoSy has no automated procedures for tracking activity built in to the code. In the end, a program was written to give four kinds of data: time online, number of characters input to conferences, and number of conversations set up. These three could then be separated between students and tutors. With 1300 students

and 65 tutors to monitor, the kind of basic information which these statistics provide is invaluable for developing an overall perspective on the use of the system. Rice (1984b) summarises the considerable advantages of computer-monitored data:

> Data collection can remain unobtrusive, reducing such threats to validity as demand characteristics and interviewer bias (Webb and others, 1981). Further, the data are not based on remembered or perceived reports of communication behavior; instead, they represent actual communication behavior. . . It is nearly as easy to capture the entire census of user behavior with the computer as it is to sample, which satisfies the need to measure the relations among all users. Systems can monitor usage over their lifetime (or at least over the lifetime of the evaluation), so longitudinal evaluations of complete populations of users are possible. Thus, the process of adoption and use as reflected in communication behavior can be described and analyzed to an extent impossible without computer-monitored data. (p 61)

The major shortcoming in the statistical data available for this thesis is the lack of information on mail messages - neither the number sent nor the number of recipients. Evidence about the way in which email was used by students and tutors has been gained by other methods, but it remains sketchy. The lack of statistical data to reinforce this more individual and anecdotal information has led inevitably to a cursory treatment of the private mail interactions, while underlining the strength and reliability of the two kinds of data in combination as applied to the treatment of conferencing.

As outlined in Chapter Two, one of the course requirements was a project which tested students' understanding of the practical work of the course. This consisted of writing a report on the social, technical or educational aspects of computer-mediated communication. Students were sent two questionnaires, one to be completed before logging on to CoSy, and the second towards the end

of the course. Answers to both were to be up-loaded to the mainframe and the results from all students were subsequently made available for downloading into the two data analysis packages on the course. The report was to be based on personal experience, material from the course and the database of student responses. A copy of the two questionnaires is contained in Appendix Two, and permission has been obtained to use information from the database for this thesis. In addition, 40 of the 'best' projects were submitted by tutors for a prize which was offered by the course team. These contain some novel cross correlations of questions from the database in addition to personal insights of students, both positive and negative, about their experience and evaluation of CoSy.

Questions 20 to 23 of the questionnaire are replications from Hiltz's Virtual Classroom report (for which permission was kindly given). The idea of replicating these was to see how attitudes of American students compared with those of British OU students. The rest of the questions were devised, in consultation with other members of the course team, firstly to provide students with data to carry out their project, and secondly to give useful data to the course team on how the medium was being used. The data was aggregated and then downloaded into Lotus 123x in order to make correlations between various questions.

In the end, 864 valid entries[1] were received in the database and it can be safely assumed that these will be biased toward the users rather than non-users of CoSy. As usual with surveys, a few questions were interpreted ambiguously, and a few questions which should have been asked were omitted. Furthermore, in this case two questions contained unreliable data due to a technical fault. The most serious shortcoming of the questionnaires, however,

---

1 Of the original 1364 students, 341 failed to show up for the final exam and so dropped out of the course at some time during the year. Of the remaining 1023, 146 (14%) did not upload the questionnaire.

is that the 'before and after' basis on which they were designed was compromised by the fact that, for logistical reasons, the second questionnaire had to be completed much earlier than was envisaged - in fact before the real take-up of the medium developed. Nevertheless, this database has provided very rich data for understanding student attitudes and usage; it permits numerous cross correlations and is particularly useful in triangulation with interview data.

COMPARABILITY WITH OTHER STUDIES

Hiltz in her study of online scientific communities and of the Virtual Classroom, uses similiar sources of data: questionnaires, EIES monitor statistics, participant observation, as well as subjective impressions, anecdotal data and speculations.

> As a consequence, we worked with a holistic methodology in which the emerging list of impacts generated the conceptual structure, which in turn created the awareness and consideration of additional impacts. (Kerr and Hiltz, 1982: 91)

The major additions which this case study makes to data sources of holistic methodology are a much more thorough grounding in depth interviews with participants, and an evaluation of the educational quality of the content of conference messages. Hiltz bases her results primarily on the data from multivariate analysis of survey questionnaires, monitor statistics and comparision of outcomes with traditionally taught courses, and secondarily on qualitative data from faculty feedback, personal observations and open-ended comments from users. This study reverses the priorities and places the primary importance on qualitative data, using the quantitative data as a means of strengthening and testing the validity of individual experience.

The work of the Institute for the Future has built its methodological foundations on field experimentation, using limited controls (Vallee *et al*, 1974). The activities of 10 conference groups were monitored over an 18 month period using computer-generated statistics, interviews both before and during use, and survey questionnaires with open-ended responses. For one group of users, the researchers requested logs be kept recording each time a communication was made using a medium other than FORUM. The obtrusiveness of this method, and the high degree of commitment demanded of the user are obvious disadvantages of this method. Thorpe (1989) also used log books in evaluating the use of CoSy by tutors on DT200 and she has kindly made the data available to this study. Throughout the thesis, the source of this and all data used, is acknowledged and made evident.

The content analysis of conferences carried out by the Institute provides a very useful base on which to build an evaluation of DT200 conferences. They established three simple categories for a basic analysis: problem-solving, information exchange and general discussion.

> In these preliminary investigations, we noted that the early portions of a conference were frequently dominated by "information exchange" comments, usually involving learning about the system. Later in the conference, more "problem-solving" entries occurred, as the substantive purpose became the focus of attention. (Vallee *et al*, 1974: 71)

Their study of the threading capabilities of conferences - tracing specific themes as they weave their way through messages - led them to discover three types of roles emerging.

> In some cases, for instance, particular persons tend to introduce many new ideas, while others function as idea-developers, and still others as synthesizers of previously developed ideas. These roles could vary

> greatly among persons and conferences. Thus, by examining the overall patterns for a FORUM conference, one can see both key persons (roles) and key ideas. (p 74)

Both these areas of investigation - content analysis and multiple threads of conferences - will be pursued in this case study, and though the same categories will not be used, the groundwork already laid by the Institute's work makes a solid foundation on which to build. They also acknowledge the problem of messages containing several different categories of content, and conclude that content analysis should not be based on discrete entries.

The orientation of the Institute's methodology, with its considerable reliance on interviews and content analysis, is similar to the kind proposed for this case study. However, the primary direction of the Institute's research is in the social and organisational impact of CMC, and this inevitably leads them into areas and methods which are inappropriate for a case study of a single educational application.

ISSUES OF VALIDITY, RELIABILITY AND GENERALISABILITY

The strength of the naturalistic method lies in the richness of data which could not be collected by more controlled approaches. However, if this rich description consists of the realities of various people based on their individual values, interests and purposes, what validity does the study have and how is this to be judged? Smith and Heshusius (1986) give the purist view of validity, based in the origins of the qualitative approach to inquiry:

> Within the qualitative paradigm, valid is a label applied to an interpretation or description with which one agrees. The ultimate basis for such agreement is that the interpreters share, or come to share after an open dialogue and justification, similar values and interests. (p 9)

Validity in this kind of research, therefore, is judged by the extent to which the study presents a recognizable reality, and in the end, it is the reader who must make a personal judgement. Merriam (*op. cit.*) argues that the qualitative researcher is interested in perspectives rather than truth and the validity of this kind of research lies in the revealing of complex human situations in a holistic interpretation. (p 168)

Parlett and Dearden (1977) extend the dimensions of validity with the idea of 'audience assessment':

> Perhaps recognizability is not enough: achieving a likeness in a portrait does not make it a great portrait. A more searching criterion might be whether the study helps to increase my sensitivity and insight, or changes the way I look at things, or illuminates what was previously murky or confusing to me. Here the criterion of the study's merit shifts to the market place: has the study, at its end, been judged worth doing. Has this study advanced our understanding of educational life. (p 40)

The aim of this study is to present more than a likeness, and this means that to some extent the results must be generalisable to other institutions and other educational applications. Although the purpose of Chapter Two was to detail the unique context of this case study, certain patterns of use and elements of good and bad practice can be identified which will apply, with care, to other applications. Merriam (*op. cit.*) outlines a variety of approaches to the question of generalisability in qualitative research - working hypotheses, concrete universals, naturalistic generalisation, user generalisation. The basis on which generalisations can be made from this thesis are:

- The extent to which the study is set in context, so that those interested in transferability can clearly see what is applicable and what is not.
- The data and results of other studies are compared and referenced wherever possible, so that the typicality of this application can be established.

- The large scale of the application leads inevitably to a wide range of user attitudes and performance as the basis of the evaluation.

Reliability in scientific research refers to the ability to replicate results. What is more appropriate for qualitative research is an acknowledgement of the investigator's position and how this has developed throughout the study. Early writings by the author (Mason, 1987, 1988a, 1988b and 1989b) show an idealistic view of the potential of computer conferencing as an educational tool for distance learners. In fact the initial working hypothesis of the study was to show that computer conferencing helped to develop greater self-direction in learners. This line was abandoned early on, and, in fact, there is little evidence indicating that conferencing on this application did more than support those who were already independent learners. Interviewing, more than any other technique, gave a deeper understanding of how this new medium fits into the world of the distant learner. Secondly, participating on the course team, interacting with colleagues, and jointly producing course material gave access to the network of beliefs and assumptions, organisational goals, rewards and constraints of the Open University environment. Being on the receiving end of criticism, along with fellow course team members, from students on CoSy and through open-ended survey questionnaires, is undoubtedly a factor in the importance given to the course teams' view in this thesis. A number of central staff also tutored the course in the first year of presentation, and with hindsight it is obvious that experiencing the course as tutor would have strengthened the analysis of Chapter Six on the tutor point of view.

One personal bias which is relevant to acknowledge here is a distaste for redundant communication (whether via the conferencing medium or any other). Messages which do not extend the discussion are given scant regard and the 'less is more' principle operates for personal conference activity. This defines the author as a 'middling' user of the medium, with quite distinct

habits from heavy users, yet with more willingness to overlook the shortcomings of the medium than low users.

Having laid out the personal bias of this study, the next contribution to the question of reliability and internal validity is a discussion of triangulation. Cohen and Manion (1980) describe the nautical origins of the term triangulation, and conclude:

> By analogy, triangular techniques in the social sciences attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint and, in so doing, by making use of both quantitative and qualitative data. (p 208)

When the outcome of questionnaire data corresponds to the comments of interviewees and the observational experience of the researcher, confidence in the reliability of findings is increased. The use of contrasting methods reduces the chance that similar data is the result of similar methods. This study, as already indicated, relies on a number of different sources of data, both qualitative/interpretive and quantitative/statistical. A good example of this kind of triangulation is the issue of the amount of time students spend online. Other researchers certainly acknowledge that computer-generated data of online time is relatively meaningless: different habits of use, varying costs involved, variety of user equipment and skill, attitude, and purpose all affect whether conferencing is carried out largely online or off-line. Interviewing and participation in conferences, as well as direct questions about use in questionnaires can all be used to interpret the computer-generated data concerning time online. Any method in isolation will give either partial or meaningless data.

Another form of triangulation comes from the consideration of the different viewpoints of the three major contenders in the situation - students, tutors and the course team. Students sometimes made demands which were not

possible or educationally desirable for the course team to meet; tutors were not aware of many of the constraints under which the course team operates, and the course team generally set unrealistical amounts of practical work for students to accomplish. These conflicting viewpoints must be balanced and weighed against each other. Cohen and Manion (*op cit.*) discuss the question of how different data sources are to be combined:

> The crucial factor when it comes to integrating or contrasting the data and drawing inferences from them is the researcher's own judgement. (p 217)

Judgement is required in assigning relative weightings to different or contradictory findings and to some extent this depends on the basic aims and approach of the study. As indicated above, the naturalistic bias of this study has led to a qualitative, interpretative stance, with quantitative data used as secondary sources.

ETHICS

Considerable care has been taken throughout the data gathering process for this thesis to obtain permission for the use of statistical information and to respect the 'unwritten rules' of conference etiquette. For an earlier article evaluating this course (Mason, 1989) each student or tutor whose interview or conference message was quoted verbatim, was personally contacted for permission to use extracts. In every case, this was granted with pleasure. In relation to the student database, a letter was posted on CoSy from Coco, the course coordinating ID, explaining the nature of the evaluation and asking anyone with objections to make these known. No objections were received. In any case, student IDs were stripped from the data before access was permitted. Evaluation of the interactions on CoSy, and entry into closed tutor conferences went hand-in-hand with full participation. The advantages of this

participant observation method are clear by comparison with the experience of Phillips and Pease (1987). As external evaluators of conference interactions they encountered considerable opposition:

> Of all the issues discussed with participants, none aroused more anger nor provoked more heated debate than the privacy of conference communications. A heated argument ensued when the presence of researchers was announced, with several participants loudly voicing serious objections. At the heart of the controversy is the very nature of a computer conference, especially when being used for adult education. . . . The potential for nonobtrusive observation can lead to the temptation to spy, and several participants expressed their fear of outside observers acting like secret agents, raiding conferences at will. (p 50)

None of these reactions were met in the case of DT200, as the observer was truly a contributing participant.

LIMITATIONS OF THE STUDY

Much of the data collected for this study is biased towards those students who used CoSy. No follow-up investigation of students who dropped out of the course was made, and the proportion of drop-outs who returned questionnaires is low. Some interviews and observation at tutorials have provided data from low users of CoSy, however. Obviously the evaluation of conference interactions involves only the users, and particularly the enthusiastic users.

The problem of 'going native' is always a concern with this kind of methodology and the nature of computer conferencing, as a very alluring and labour intensive medium, tends to encourage loss of perspective. Hiltz also

acknowledges this danger in her case study (Hiltz, 1984) after admitting to 3000 hours online in the course of the research. Her solution to the problem is:

> that the data presented and interpretations made stay as closely as possible to objective evidence supplied by the participants themselves - monitor data on the amount of use, questionnaire responses, excerpts from conferences and messages on EIES. In other words, this report tries to summarize what the objective data say, and to minimize acquired biases of the participant observer. (p 23)

Accuracy is undoubtedly an accepted requirement of this case study, but the real aim is the organising and interpreting of the factual data. Many of the findings have already been made public through publications and conference presentations.

CHAPTER FIVE: THE STUDENT

THE DATA

In this and the following two chapters, the data on the use of CoSy in 1988 is presented and analysed with emphasis firstly on the students, then on the tutors and finally on the course team. The selection of data is made on the basis of the principles described in previous chapters: as a case study, the approach is holistic and descriptive; as research in a new and emerging field, the aim is to define various phenomena which are important for further exploration, and as a study carried out in the wider context of distance teaching generally as well as of other applications of computer conferencing, it presents data which is generalisable and comparable to other situations and potential users.

THE STUDENT PROFILE

The number of students who finally registered for the course was 1,364. About 100 of these dropped out almost immediately and a further 250 did not sit the final exam. This was slightly higher than the normal drop-out rate for second level OU courses. Disappointingly few students were female: 358 to 1006 males. However, Hiltz's Virtual Classroom experiments show a similar ratio: 29% female to 71% male (Hiltz, 1988).

The educational and occupational background of the student population was biased toward the technical, clerical and managerial, despite the fact that this course was developed jointly by the Social Sciences and Technology Faculties, with a major contribution from the Institute of Educational Technology. However, the range of educational and occupational backgrounds was very wide, with over 5% having no educational qualifications at all prior to their

OU study, and over 12% already having considerable experience with electronic communications.[1]

In terms of the computer communications for the course, there were very regrettable levels of disadvantage built in to the system. The OU operates a network of 17 dial-up modem bureaux throughout the country, providing local call rates for students living near these areas. Despite considerable efforts to provide similar rates for all students, one third of the students were required to pay long distance charges for all electronic communications (*b* or *b1* band). In fact, only half of the students were within local call distance of the nearest dial-up node and an intermediate charge (*a* band) applied to just under a quarter of them. Those living in the most remote areas of the country, who, it could be assumed, would most benefit from increased access to communications, were most disadvantaged. The map in Appendix One shows the different charge bands applicable over the whole country.

Fortunately more than two thirds of the students had the facilities to have their computer workstation permanently set up, but that leaves a significant number who either had to pack up the machine after each use, or did not have free access to their machine at all times.

The computer literacy of the student population on the course ranged from about 20% with no experience of micros, to half with word processing skills. Many were games players or business package users. Again, this percentage of computer novices is similar to Hiltz's Virtual Classroom students (22% novices).

---

[1]See Appendix 2, questions 30, 3 and 16, 17, 18 for tables on the occupational composition, educational background and computer experience of students.

COMPARISON WITH HILTZ'S RESULTS

As mentioned in Chapter Three, Hiltz's major finding over a number of years of early research was that the educational background, typing ability and computer literacy of prospective users does not predict their later take-up of the conferencing medium, whereas pre-use motivational and perceptual factors do (Hiltz, 1984: 68). As this finding has significant implications for the spread of use of the medium, an attempt was made to see if this result would replicate amongst British Open University students. Consequently, a number of questions from Hiltz's pre-use questionnaire were used on the DT200 project questionnaire (Q. 20, 21 and 22).

1. I expect it to be: 1 hard to learn . . . 7 easy to learn

OU	3.9%	5.3%	19.7%	20.1%	28.2%	12.1%	10.5%
Scale	1	2	3	4	5	6	7
VC	2%	6%	12%	9%	15%	35%	20%

2. I expect it to be: 1 impersonal . . . 7 friendly

OU	9.6%	12%	24%	22.5%	17.3%	8.4%	6.1%
Scale	1	2	3	4	5	6	7
VC	5%	8%	10%	12%	19%	31%	15%

3. I expect it to be: 1 a waste of time. . . 7 a productive use of time

OU	.3%	1.8%	5.6%	16.2%	22.2%	21.6%	32.2%
Scale	1	2	3	4	5	6	7
VC	3%	3%	8%	16%	20%	32%	16%

Table 5.1 Comparison between the OU and the Virtual Classroom

This table shows that OU students expected computer conferencing to be much more difficult to learn and impersonal to use than the Virtual Classroom students, yet a more productive use of their time. However, as mentioned in Chapter Three, the majority of Virtual Classroom students were young undergraduates at place-based institutions logging in from campus terminals. Most OU students were adults using workstations in their own homes.

After correlating these pre-use variables with answers to post-use questions, Hiltz concludes:

> As would be expected, those with more positive attitudes towards computers at the outset were more likely to report more favorable course outcomes, to spend more time online, and to log on more frequently. They were also more likely to report that EIES was "easy to learn", less likely to feel at the end that they would not choose to take another online course, and rated the Virtual Classroom mode of delivery more favorably in comparison to face-to-face classes. (Hiltz, 1988: 192)

In the case of the OU database, when these same pre-use variables as well as some others, were cross-tabulated with a variety of post-use questions, the following results were obtained:

- *Figures 5.1 and 5.2* Those with the most positive pre-use attitudes (Q. 23) compared conferencing favourably with telephoning their tutor, as a source of moral support and as a means of getting help with the course (Q. 54).

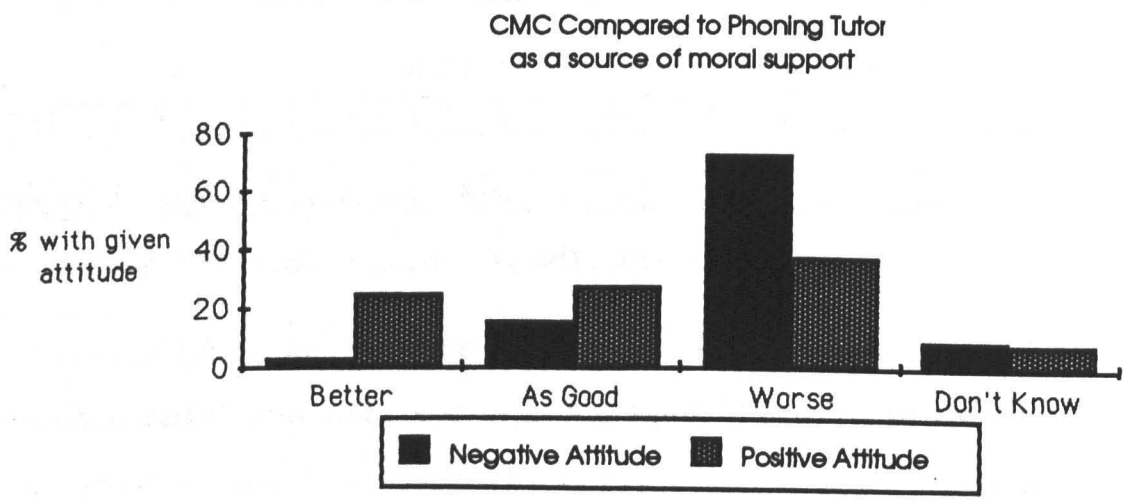


Figure 5.1 Conferencing and Moral Support

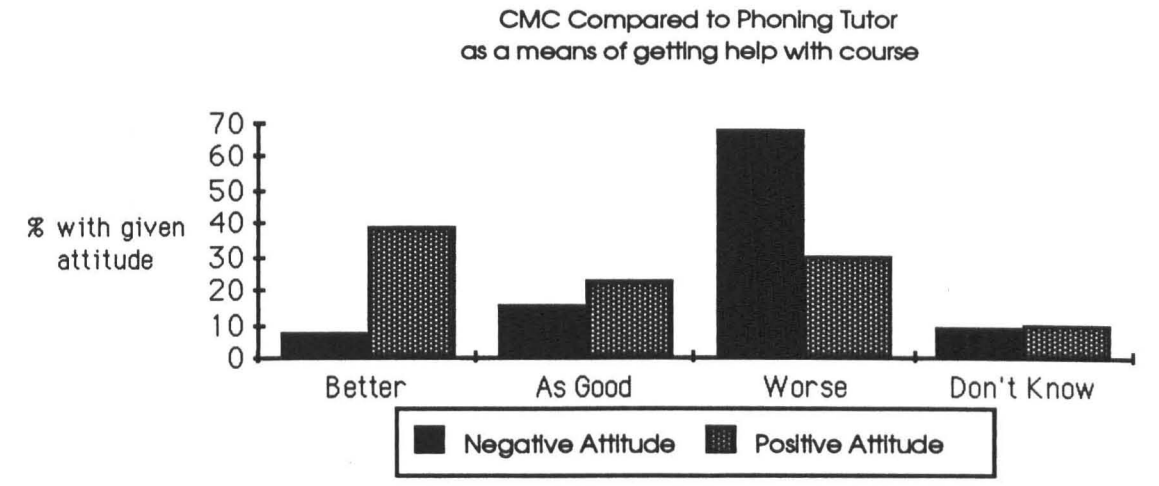


Figure 5.2 Conferencing and Getting Help

- *Figures 5.3 and 5.4* The percentage of students experiencing difficulties - whether technical (Q. 39) or non-technical (Q. 40), was roughly the same regardless of educational background (Q.1 previous arts or technical courses).

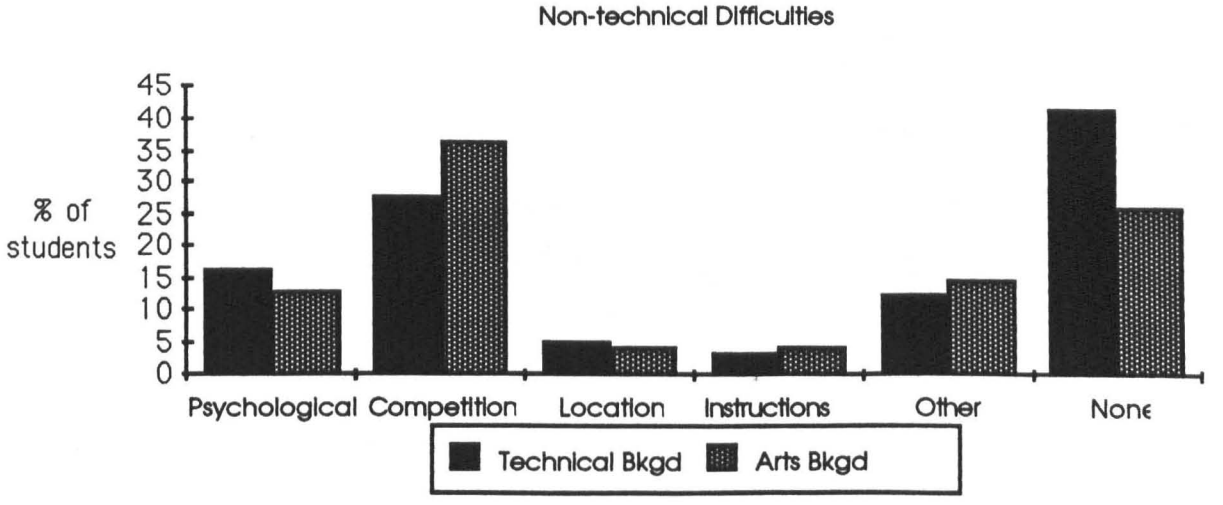


Figure 5.3 Non-technical Difficulties

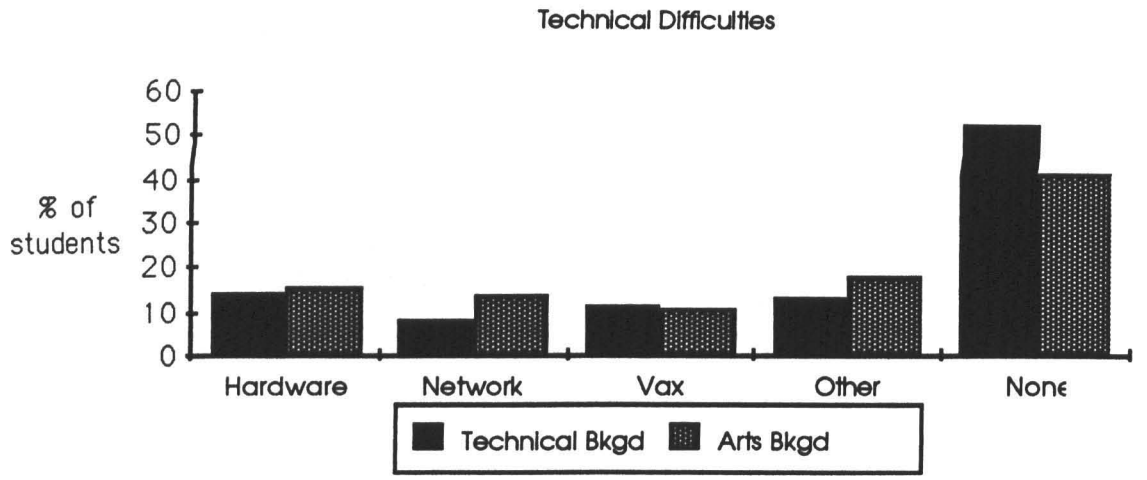


Figure 5.4 Technical Difficulties

- *Figure 5.5* Previous experience of computer-mediated communication (Q. 31) had little effect on the amount of DT200 use (Q. 35) - in fact, there were far more novice students who used CoSy frequently than used it only a little.

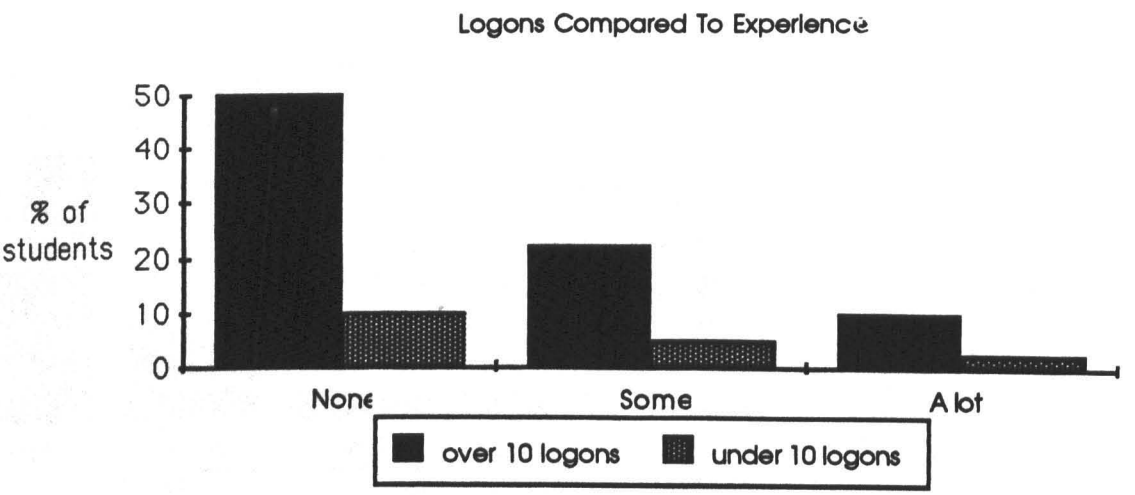


Figure 5.5 Amount of Use

- *Figures 5.6 and 5.7* Neither the pre-use expectation of difficulty (Q. 20), nor of friendliness (Q. 22) were predictors of subsequent use (Q. 35) - in each category of usage, the expected ease and friendliness are on the whole, normally distributed.

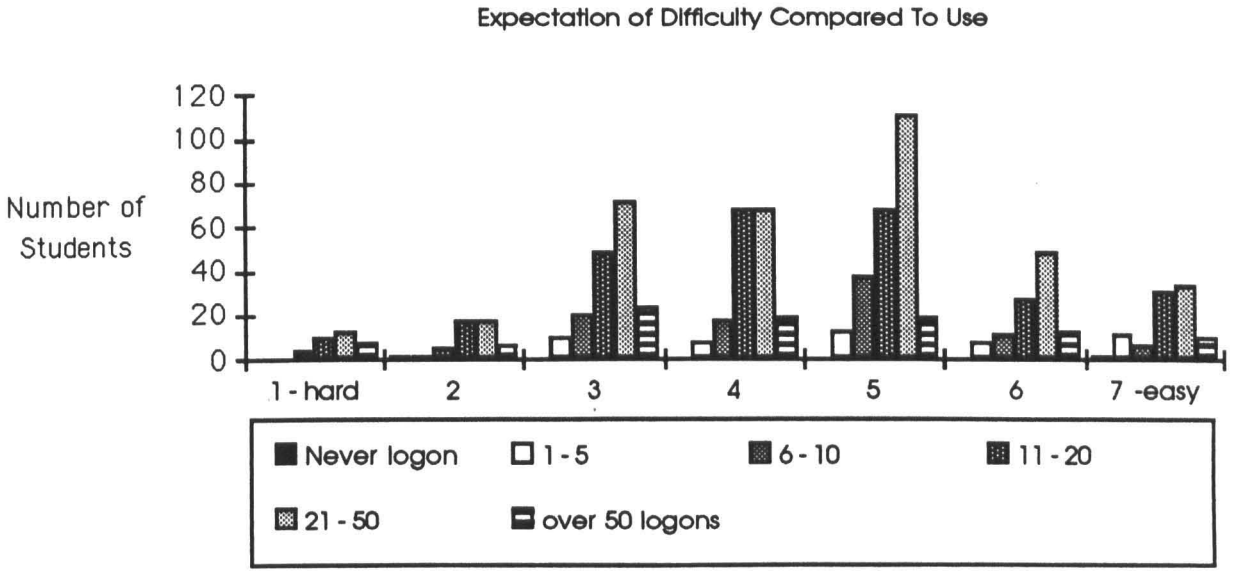


Figure 5.6 Expectation of Difficulty

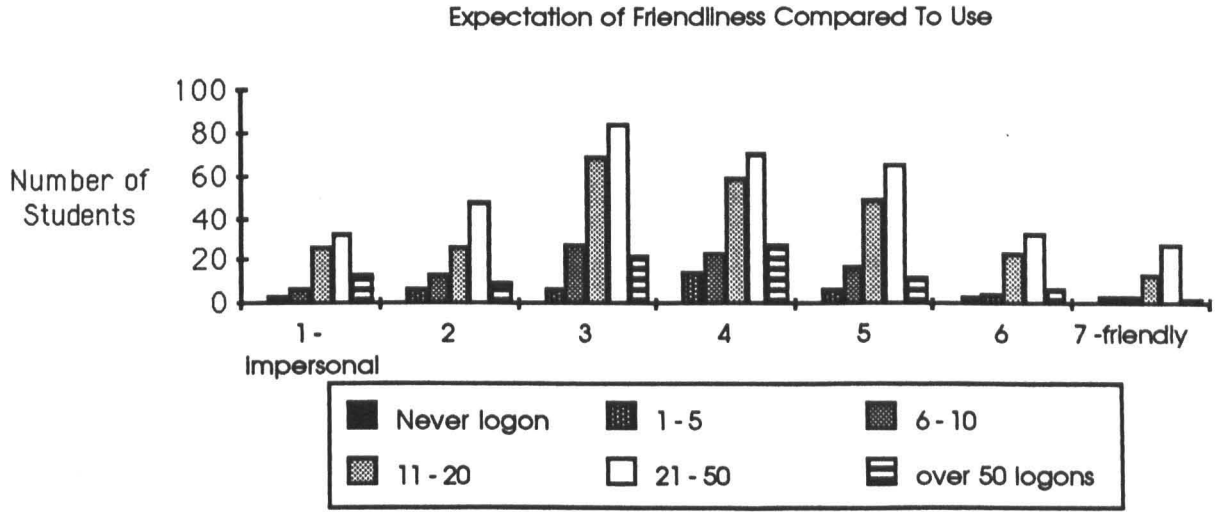


Figure 5.7 Expectation of Friendliness

- *Figure 5.8* The strongest pre-use predictor of subsequent use (Q. 35) was the expectation of productiveness (Q. 21) - in each category of usage, expectation of productivity is a one-sided distribution peaking at highly productive.

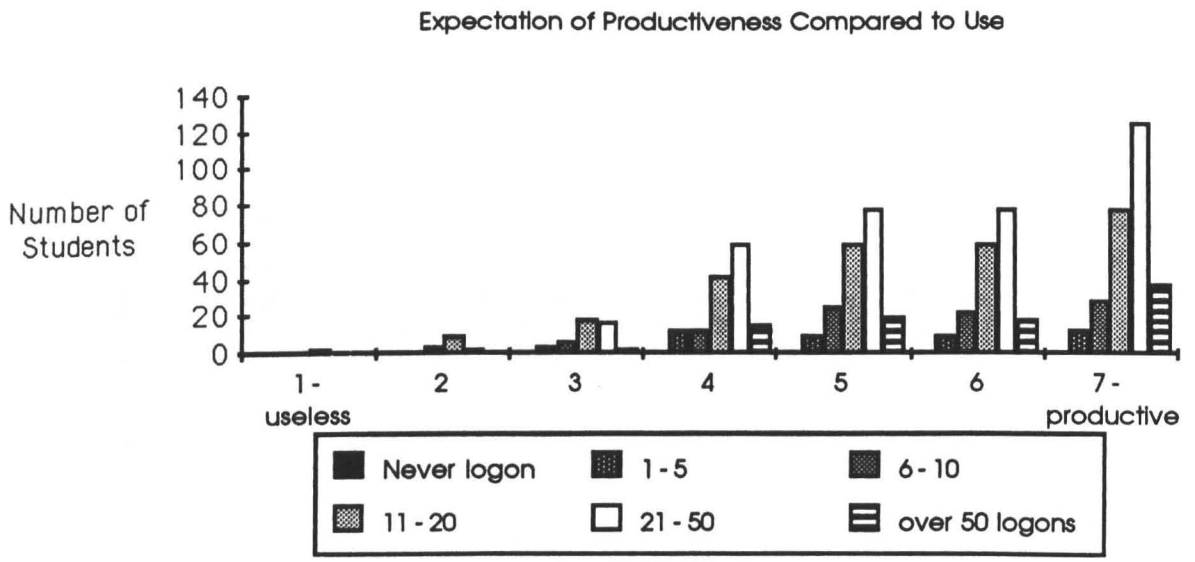


Figure 5.8 Expectation of Productiveness

Open University students were not affected by their expectations of how difficult CoSy would be to learn, nor how impersonal they expected it to be (ease of learning: $x^2(1)=1.42$, $p>.05$; impersonal: $x^2(1)=.05$, $p>.05$). What most determined their take up of CoSy was their expectation of its usefulness (usefulness: $x^2(1)=10.49$, $p<.05$)[1]. This finding refines Hiltz's general predictors and applies it in the OU context. Some of the comments reported by students in the rest of the chapter further support this finding. Whether it would generalise to other adult distance education institutions is an interesting research question.

The Institute for the Future studies also concluded that computer expertise is not a prerequisite for a positive attitude toward computer conferencing (Vallee *et al.*, 1975). However, they did find that previous computer experience may be a factor in ways of using the system. Correlations between questions on the DT200 project database also show differences in use according to background:

---

[1]These Chi squares were calculated by collapsing the 6x7 into 2x2, where usage was <20 or >20, and ratings were 1-3 and 5-7, with neutral (4) deleted.

- *Figures 5.9 and 5.10* The more previous experience students had with computers (Q. 16), the less need or use they made of the optional menubar (Q. 51).

Figure 5.9 Need for Menubar

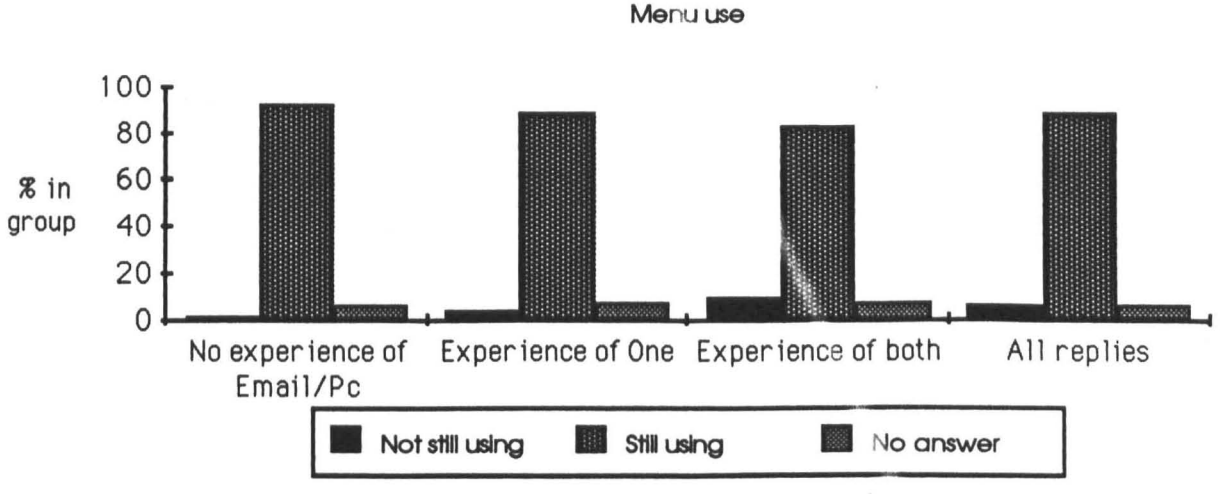


Figure 5.10 Use of Menubar

Of course, by far the most significant findings in the above are that very large numbers of both experienced and inexperienced students found the optional menubar helpful and made significant use of it. Nevertheless there is a tendency for the experienced students to need it less, as would be expected.

- *Figure 5.11* The more previous experience students had, the fewer unsuccessful logons they reported (Q. 35).

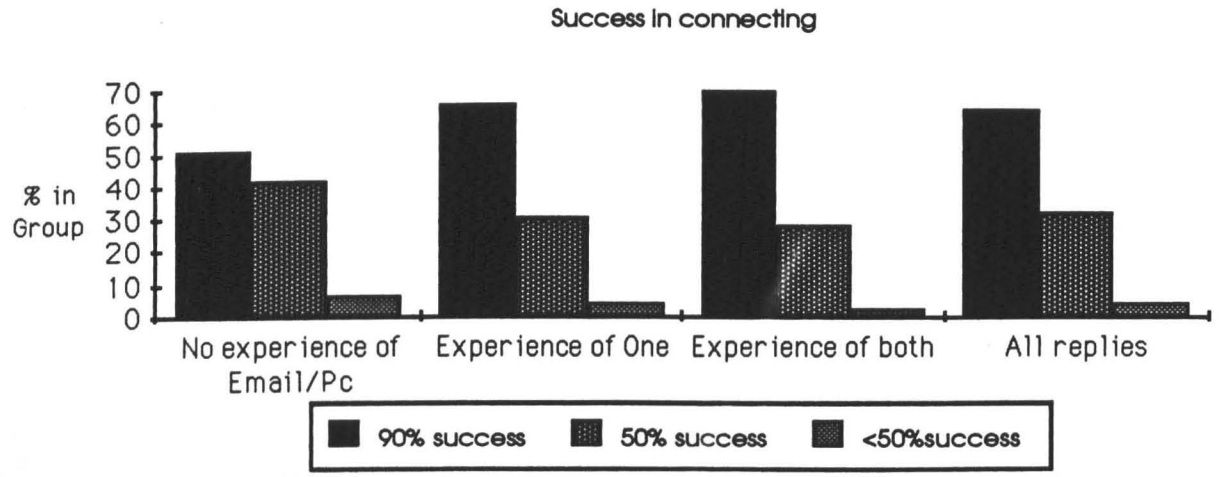


Figure 5.11 Successful Logons

Again the tendency for experienced students to be more successful is weak.

- *Figure 5.12* The more experience students had, the fewer difficulties they reported in following the instructions for learning to use CoSy (Q. 40).

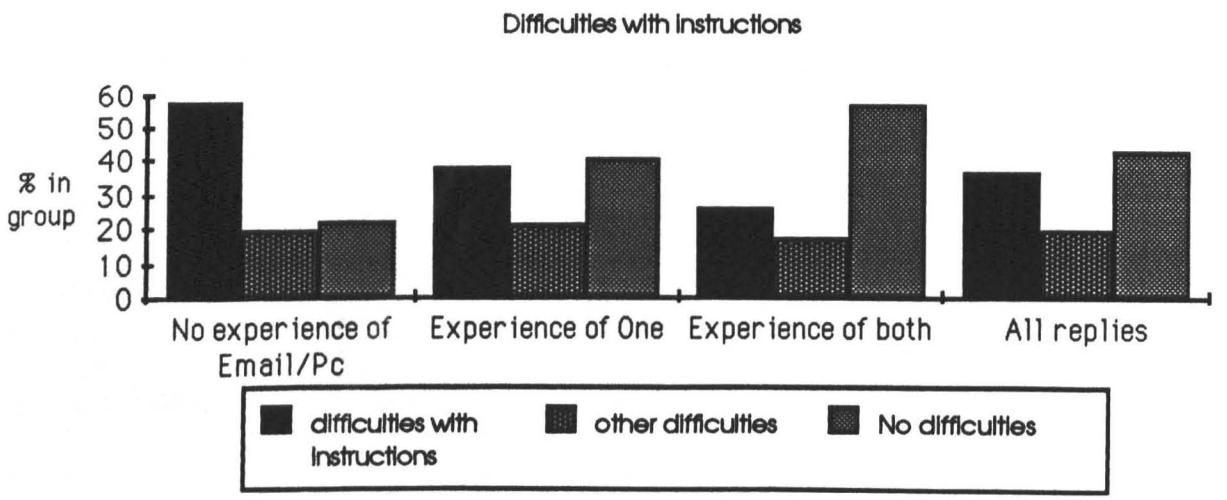


Figure 5.12 Following Instructions

The histogram in figure 5.12 shows stronger evidence of the advantages of previous experience. Data from the DT200 application, therefore, supports other findings that previous experience does not determine uptake and attitude to the medium, although it may be an advantage in learning and using the system.

In her case study of online communities of scientists, Hiltz found that the participant's own estimate of the time they will spend online, before ever using the system, is the strongest predictor of the level of eventual use of the

system (Hiltz, 1984). The OU database, unfortunately, did not question students in this way, and Hiltz's finding is only weakly supported by interview data: the 15 students from two tutorial groups were asked before using CoSy to say how often they expected to log on. Three months later, about half-way through the course, they were interviewed again and asked to say about how often they logged on. Although two students reported using conferencing more than they predicted and four were using it less, the majority (9) were using the system as anticipated beforehand. A much stronger predictor of eventual use in the OU case, is the 'expectation of productiveness'.

USE OF COSY IN 1988

The course materials suggested to students that about 10 hours online time was adequate to carry out the required work on CoSy. In the event, the range of student use of CoSy was very wide, with significant samples in all categories from total non-use, to minimal use, to more than the course requirements through to exceptionally heavy use.

hours	students	hours	students
none	115	10 - 20 hours	259
up to 1 hour	72	20 - 30 hours	39
1 - 2 hours	94	30 - 40 hours	24
2 - 3 hours	124	40 - 50 hours	5
3 - 5 hours	213	50 - 100 hours	12
5 - 10 hours	380	100 - 200 hours	5
		> 200 hours	2

Note: There were 1364 students in all.

Table 5.2 Total Student Hours on CoSy on DT200

Clearly, students made very unequal use of the system. An approximate reading of this table would show that about one third of students either never started or just learned the rudiments of electronic communication (under three hours); about one third used the system according to minimum course

requirements (up to 10 hours), and the final third used the system considerably more than was required (10 to 200 hours).

One of the initial exercises in the course material on CoSy involved students logging on, finding a welcome message from the course co-ordinating ID, called Coco, and replying to indicate that they had managed to arrive on the system. The system opened to students on March 25th and the teaching unit about CoSy was scheduled for the month of April. Figure 5.13 shows how many students were still coming onto the system well after this date. It also shows the fact - contrary to many skeptical course team members' predictions - that about 95% of students did manage to log on and reply to a mail message.

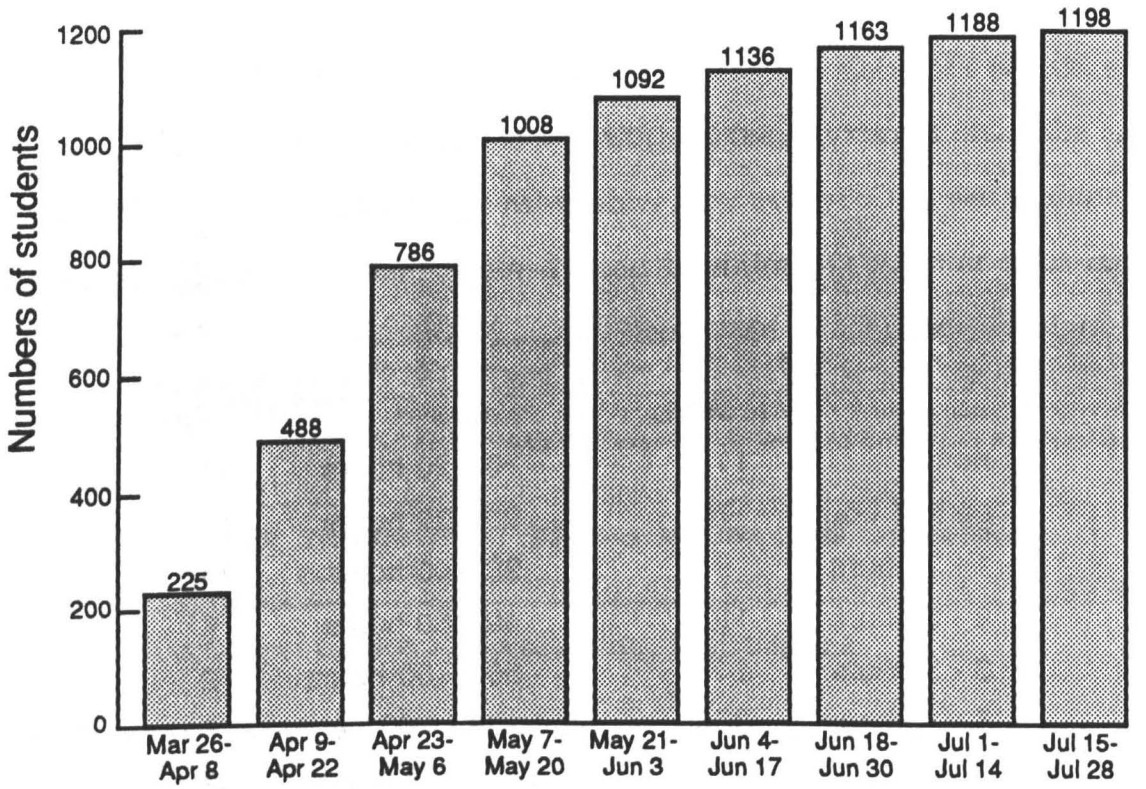


Figure 5.13 Replies to the Coco Welcome Message

The 1988 application of CoSy, therefore, shows a lack of *sustained* use, not an inability to use it. The implications of this high success rate, but low user rate, will be brought out throughout the three data chapters.

As students were clearly able to log on, what did they do whilst online? As described in Chapter Two and particularly Figure 2.1, students could use the

electronic mail facility within CoSy, the conversation area for less formal discussion, and the conferences, both those in the DT200 environment and any others on the system which were public. The DT200 conferences consisted of individual, closed tutor groups, read-only conferences for information from the course team, and a 'lounge' and 'forum' open to all students (and any other CoSy users). The course team expected students to make their tutor group conference the main focus of their online activity for discussion about the course with their fellow 25 students and tutor.

By far the most significant and unexpected outcome of the use of CoSy in the first year was the lack of academic discussion and activity in the 65 tutor conferences, and the relatively large amount of activity in the 'national' conference, Forum. Table 5.3 shows the total number of messages by the end of the year in the course conferences. The gremlins topic, where students sought help with technical or practical aspects of the course, was the most heavily used. The Block 4 topic, which was guided and stimulated by the course team member responsible for the corresponding text material, had the third highest activity. Discussion of later blocks towards the end of the course was very sparse, though the messages in the practical and project topics picked up as the deadline for submission of the project approached.

The mean and standard deviation for the 65 tutor conferences show a very wide variation in usage. The role of the tutor in this wide variation will be discussed in Chapter Six; however, it is important to note here that the content of messages in the tutor conferences was almost invariably on the level of information exchange, rather than of discussion, opinions, comments or critiques. Most tutors reported that the number of active participants was about five students, though some conferences 'died' completely and others had as many as 15 students who put in one or more messages. The table also indicates that the chat topic in the tutor conferences was the most heavily used.

What was surprising to the course team, and indeed to tutors and students, was not the low level of participation - this is standard in face-to-face tutorials and in viewing rates of broadcasts, but the inability of even the most diligent and enthusiastic tutors to stimulate sustained interactive discussion in the tutor group conferences.

National Conferences

DT200-Forum

block00	263	block6	6	gremlins	715
block1	120	block7	5	guidelines	90
block2	164	digest	13	prac(tical)	235
block3	131	errata	67	proj(ect)	254
block4	291	exam	71	tma	215
block5	166	gen	354		

DT200-Lounge

chat	607	moans	92	newconf	135

Local Conferences:

Tutor Groups (n=65)

topic	total messages (all conferences)	mean (per tutor group)	standard deviation
block	524	8.1	8.0
chat	2461	38.5	29.8
practical	764	11.9	12.1
project	445	7.0	8.5
tma	709	11.1	9.9
other	348	na	na

Table 5.3 Messages in CoSy Conferences by Sept 20, 1988

The first fact which must be made clear about participation in the Forum is that only 26% of all students were contributors and about 53% read or scanned some portion of the messages. The Forum consisted of many topics: there was one for each block of the course, one for the project, for practical work, for the assignments, for gremlins and several others added as the course proceeded. In the early stages there were many messages which were garbled, in the wrong place, completely irrelevant, or glib. These diminished with time and the topics came to be dominated by about 100 regular contributors (students, tutors

and staff) with new students making a first appearance at frequent intervals. A rough indication of the level of contribution, lurking and complete withdrawal can be seen in Table 5.4. One of the most notable figures in the table is the number of students who read but never contributed messages.

1364	students initially registered
110	students never logged on at all
162	students never entered the Forum conference
728	read but never contributed to the Forum conference
364	were individual contributors of at least one message

topic	# of contributors	topic	# of contributors
Block 00	121	digest	69
Block 1	69	errata	33
Block 2	67	exam	35
Block 3	67	gen	99
Block 4	72	gremlins	156
Block 5	55	guidelines	34
Block 6	6	prac(tical)	92
Block 7	7	proj(ect)	86
		tma	82

Table 5.4 Use of the Forum Conference

A detailed content analysis of the topic, 'block4', of Forum will be made later in this chapter.

Use of Email

As mentioned in Chapter Four, the major shortcoming in the statistical data available for this research is the lack of any computer-generated statistics on the number of mail messages sent on the course. However there are indications both in conference messages and from interviews that many students took advantage of this new ability to contact their tutor or other students.

I find mail very useful, much more so than the telephone. . . It keeps conversation short and to the point. It is also direct to the person concerned - no telephone tag. It really is efficient - you get good feedback from it. (I,2,S)[1]

Tutor - I have a student in Her Majesty's Prison who sends me a mail message nearly every day - little queries, comments on how he is getting on - anything really. (I,4,T)

I was also interested in the way that I and all the others new to the system gradually expanded the way we used it. At first it seemed to be used mainly for practical, one answer type questions, and then as we got better at it we were able to develop our ability to use the medium for discussion of the social science side of the course. As my skills in using CMC grew there was plenty to discover in the way of conversations, new conferences and an increasingly full mailbox. (C,1,S)

This section has shown the pattern of CoSy use and how it developed and changed over time. By far the majority of students logged on once and answered a mail message. Many of them continued to use mail and to read conferences, but only one third became interactive participants. Despite prodings from tutors, the 'local' conferences never became a focus for discussion, and the active users gravitated to the national topics for interactive participation.

---

[1]The following format has been adopted for quoting from data sources: interviews, student projects, CoSy messages and Home Computing Evaluation Surveys are identified as I for interviews, P for projects, C for CoSy messages and HCE for the HCE surveys. In addition, contributions have been numbered so that extracts from the same person can be identified. Finally, the letter S denotes quotations from students, T for tutors and CT for course team members. For example, C,2,S means CoSy message from student number 2.

REASONS FOR USE

As outlined in Chapter Two there were a number of ways in which members of the DT200 course team expected that computer conferencing would appeal to students: convenience, increased access to help, equality, active learning environment, and social needs. Data on each of these features will be presented in turn.

Convenience

A series of questions about the convenience of electronic communications was included in the questionnaire for the course database (Appendix 2 question 53, 54). These show that about 60 to 70% of students returning questionnaires found conferencing less effective for contacting their tutor, getting help, socialising and saving time and money in travelling. However, it must be remembered that these question had to be answered by students, not at the end of the course as originally conceived, but in the middle of it. As Figure 5.13 has shown, some students were logging on for the first time in July, just as the database was about to be closed for further entries. With this in mind, it is remarkable that nearly 40% of the 875 students who uploaded the questionnaire, found conferencing as good or better a means of getting help or moral support as telephoning their tutor. Even more remarkable is that, at this point in the course with such a small role in the whole course, nearly 375 students (43%) could say that conferencing was as good or better a medium for intellectual exchange as a face-to-face tutorial.

Data from CoSy messages and from interviews indicate the ways in which conferencing was a convenient medium for those students who used it.

> I have never been one to contact my tutor because I find it very difficult to disturb someone at home or at work with what might be a trivial point. I know they have elected to do the job but I still feel I might be

inconveniencing them. Telephoning fellow students is even worse because (i) they are not paid and might not want to be bothered, and (ii) they might not be able to help. As a result I have studied previous post foundation units in relative isolation. . .If I have problems I can log onto a conference and leave a message knowing that I am not inconveniencing anyone. Those who want to respond will respond and at a time that suits them. Further I may get several responses and hence a variety of views to my question. (C,14,S)

It is easier to sit down at the computer than to get to tutorials - and it is quite nice to be able to type in a message and know I will get an answer. (I,10,S)

Increased access to help

There is considerable evidence to show that for those students who made any significant use of the conferencing system, the increased help available was highly valued. The database answers to questions 46 and 47 confirm that of all possible sources of help (tutor, fellow students, spouse, Academic Computing Help service, other people) the messages on CoSy were rated as the most valuable. The 'gremlins' topic, where students were to report practical problems was the first conference to take off, with over 500 messages generated in the first three months. A number of students and tutors took a very active part in supplying 'fixes' for the many difficulties reported there. Indeed, these active participants were in most cases considerably ahead of the course team in providing useful advice and support to students. This topic was outstanding as a vehicle for those with expertise to become known on the system and to offer the benefit of their experience to students and the course team alike.

I found that whenever there was something puzzling me, particularly involving the practical side of the course, I invariably 'logged on' to find that someone else has already asked the question and received the

answer. This had additional psychological implications in that I felt that there were others 'out there' who were also experiencing the same difficulties and was conducive in building my self-conficence towards the technical aspects of the course. (P,16,S)

In contributing personal views to the project assignment, one student said:

I have found electronic conferencing and e-mail to be a very effective means of obtaining help with course difficulties. I have also felt constantly 'in touch' with both tutors and students throughout and the wealth and variety of experience, knowledge, information and friendship available without the barrier of distance or time has proved limitless. (P,17,S)

With the notable exception of a few discussions initiated by staff members, the help and expertise available on the system were of the 'one or two message' variety. There was very little extended discussion of relevant course issues. It was certainly envisioned that students with a social science background would provide help and support through CoSy to more technology oriented students and vice-versa. Although there was considerable discussion on various Forum topics about the alleged social science bias of the course and the difficulties which technology students were experiencing with writing the assignments, there is little evidence that CoSy did more than offer a space for students to moan about these problems. The hope that students would pick up 'the language of the discipline' or deepen their understanding through discussion of areas in which they had little background went largely unrealised for the majority of the students. However, there is evidence that this 'cross fertilisation' did take place for some of the very frequent users of CoSy:

I used the system nearly every day sending mail and taking part in conferences and conversations. I quickly became aware of where the expertise lay within the student body in particular subject areas whether

technical or social sciences. The discussions on each block were especially helpful in enabling me to view aspects of the course from differing perspectives. This was invaluable to me coming from a science/one answer/ background. (C,3,S)

My initial fears about my lack of experience in Social Science subjects were wiped away by others in my situation or those with less of a technical background anxious for support. The power of 'peer group teaching/tutoring' became very apparent and underlying this immense resource was the excitement of actually using the system. (C,4,S)

My job involves nothing more technically revolutionary than a telephone, and in my three years with the OU I have not taken any courses with any science or technology content. The use of CMC for more serious purposes has also improved the quality of my studying. More frequent contact with a wider variety of students than I would meet at tutorials and access to members of the course team has widened my outlook on the various topics, and has brought the whole course to life. I have found that I have spent far more time studying, as well as spending time on-line, because I have wanted to follow up discussions. . . For me the practical element of the course would have been impossible without CMC. I think that for people attempting to master skills in technical areas there is a great need to be able to communicate with others easily. Many times I would have given up if there had not been opportunity to scream for help in a conference where I knew I would not be interrupting someone's dinner! (C,5,S)

These extracts give a picture of the value of CoSy to those who took advantage of its potential. Central to all of them is the facility to access other students - with different perspectives, expertise and backgrounds. The following extracts from exchanges in the 'general' topic of Forum elucidate the kind of interactions that these enthusiastic students report as beneficial to their

studies. The messages develop through five stages: point, counter-point, compromise, elaboration and restatement of counter-point. By engaging in this kind of discussion, and to some extent even by reading it, students develop their skills in the language of the discipline.

> De-skill or re-skill? As a technologist, I'd like to add the following to the debate about de-skilling. It is too simplistic to say that IT de-skills jobs. In fact it doesn't. What it does is to change the skill levels of various jobs in both directions. For example, the job of the copy typist becomes either operation of a word processor, moving up to desktop publishing - a job of a higher skill and interest level - or moves downward to simply printing off work produced by others. The middle level job is replaced by others at both higher and lower skill levels. . .(C,24,T)[1]
>
> IT doesn't de-skill!!! Tell it to Conrath's marines. It all sounds very nice and plausible, but I'd accuse you of being simplistic, or at least seeing only what fits your perspective. Surely the main engine behind the introduction of IT is profit and the savings that accrue from reducing staffing levels. Also, I doubt if many people have their skills uprated by IT. . . (C,39,S)
>
> Whilst [the first message C,24,T] makes the point that the use of IT makes for an ordered approach to the re-distribution of middle level skills, I doubt if this is really an accurate assessment. . .However, [the next message C,39,S] goes too far in the opposite direction. . . Generally IT systems do not arrive over night. Most will cost a lot of money and will have been authorised as either revenue or capital investment.

---

[1]As indicated earlier, the 'T' in this notation indicates that the CoSy message was sent by a tutor. Interestingly, it is clear in subsequent messages, though not in the parts extracted here, that students did not know they were conversing with tutors, as well as fellow students.

> Very few (responsible) managers will seek to put staff on 'degraded' jobs. If he does, he will very soon have problems on his hands. . .It is too easy to blame problems on IT rather than face up to the fact that you got it wrong in the first place! (C,25,S)
>
> There is an additional angle to de-skilling. Computer technology removes the need for some skills and those skills die. The owners of such skills move up, down or away. What happens if those skills are needed again, or if others need training in the basics of those skills before using the computer technology to do the 'hard' work? (C,22,T)
>
> What I'm getting at is the differential effect of IT on society. The middle class tend to 'gain' from IT while those of the working class that are affected, tend to 'lose'. (C,39,S)

These very abbreviated extracts give some sense of the way in which CoSy helped 'lurking' students view aspects of the course from differing perspectives, and provided an opportunity for contributing students and tutors to argue quite different points of view.

Equality

In three very important ways, the alleged equality of participation in computer conferencing was not a positive feature of this application:

- the inequality in the cost of accessing CoSy led, not only to considerable criticism from students, but ultimately to the lack of use made of the system by a very large number of students
- technical difficulties, which will be discussed later in the chapter, prevented some students from accessing the system
- students made very unequal use of the system as Table 5.2 indicated.

In certain other respects, however, the use of CoSy increased students' ability to participate equally. Harasim finds, in graduate online courses, that communication among class members in online courses is relatively equitably distributed (Harasim, 1987). Statistics from the DT200 Project database confirm that students did appreciate conferencing as an 'equal opportunity' medium. Nearly 500 of the 875 who answered the question (57%) agreed with the statement that "individuals can participate more equally in electronic than in face-to-face communication".[1]

Students who worked unsocial hours or were disabled or housebound, were suddenly able to take as much advantage of what was offered as other students.

> Studying at home is not the best method for many. There is even less motivation to work if you do not attend tutorials and meet with other students. Of course you can talk to tutors, and they will come to your home if you cannot get out and about very easily, but it does not replace contact with other students. This is where CMC is invaluable. It cuts down isolation, removes barriers and can help increase equality. (disabled student, C,6,S)

> The 24 hour availability of the system removes inequalities of study time and enables studies to be more integrated with the life style of the student. (P,18,S)

This same student goes on to say:

> CMC is also a major decentralizer which can encourage participation as well as become a forum for a wide range of competing perspectives. CMC also alters some of the traditional power relationships in

---

[1]See question 55 in the Project Database, Appendix 2.

education with students being able to influence tutors, staff and academic teams in ways previously impossible. (P,19,S)

The peculiarly personal yet detached atmosphere of conferencing obviously encouraged many students to express their opinions, whether positive or negative, and to contribute information from their previous experience, with all the hallmarks of equal members of a group. The feeling shared by some students and tutors of being involved and even influential participants, rather than passive recipients of a course, underlies some of the enthusiastic remarks quoted throughout the chapter.

Active learning environment

Strictly speaking, the conferencing element of DT200 amounted to about 5% of the course: it was a piece of software for students to experience, plus a half-time substitute for face-to-face tutorial support. Nowhere was it specifically spelled out as a teaching medium or a vehicle for course presentation. Nevertheless, some members of the course team hoped that the active and interactive potential of computer conferencing would be welcomed by at least some students. In fact, the course material suggests this:

A successful computer conference can give its members the excitement of being part of a group mind, whose joint output is greater than the sum of its members' contributions. They are a very good way of asking for help of many forms. . .

Existing use of computer conferences in education has been largely experimental, and has never been attempted on a course anywhere near the size of DT200. We hope that computer conferences will make a big difference to distance education, and to the Open University especially. It can reduce the isolation many students feel, and offers much more two-way interaction than other OU teaching media. It is well-known

> that active participation in discussion deepens understanding in a way reading alone cannot match. (Alexander *et al*, 1988)

This ambiguity of the status of conferencing on the course will be discussed in greater depth in Chapter Seven. In the event, a number of staff enthused by the medium did gradually begin to exploit its educational potential as the content analysis of one of the conferences will show. Only a small minority of students contributed to these interactive discussions, and on the whole, conferencing did not have a high enough profile on the course to be a medium for discussing course issues in depth.

> My own personal attitudes to CMC have not altered a great deal since commencing the course. I still feel it is rather exciting and extremely interesting, and I wish that DT200 had allocated a more realistic work schedule, which would have enabled me to participate in what I believe is a very exciting medium of communication. (P,20,S)

Of all the course team hopes for the exploitation of CoSy, its potential as an active learning environment was the least actualised in 1988 in terms of the amount of interactive discussion of central course issues. However, the quality of some of the exchanges, and the easy interactions of students, tutors and central staff gave clear indications of what was achieved even in this application.

Social needs

The social needs of distance students are composed of a number of different elements. The question in the database on the social aspects of CMC was perhaps too narrow to encompass this range and this probably explains why the qualitative data is somewhat at odds with the quantitative responses from the database (see Appendix 2, question 53). Only 157 of the 847 responding students (18%) said that conferencing was as good or better a means of

'socialising' as a face-to-face tutorial. However, evidence from CoSy messages and from interviews shows that conferencing met many social needs of students - even of those who were infrequent users. As part of the project, one student expressed surprise at these database responses and went on to add her own personal perspective:

> As an Open University distance learner the sense of academic isolation can sometimes be quite strong, especially during the summer when there are few tutorials. Admittedly the self-help group in my area is quite active but I have found it an additional source of comfort to be able to 'log on' and immediately feel 'a member of the course'. It is this sense of 'belonging' which relates particularly to an Open University student that is an important factor, obviously it is not the same sort of interaction that takes place in the bar on campus or over coffee at recess but it is important. (P,21,S)

The psychological effect of having the facility to contact the tutor or get help electronically was strong for many students, particularly those who made minimal use of CoSy:

> Q. Has the ability to contact other students, your tutor or the central staff made any difference to you as an OU student this year?
>
> A. Oh yes. I don't feel anywhere near as isolated. I did T301 last year and was very very much on my own. I don't feel anywhere near as isolated this year. I could have done with conferencing last year.
>
> Q. A psychological feeling or an actual fact that you can and do contact other people?
>
> A. Both, though possibly more that I could if I needed to. (I,4,S)

Students who 'lurked' in rather than contributed to conferences felt reassured on one of the most frequently cited drawbacks of distance learners - not being able to assess their progress in relation to other students.

> Q. Would you like to see more academic discussion in the tutor conference or do you find that the social function is beneficial in itself?
>
> A. In itself yes, I think it is beneficial. I have never felt so comfortable doing an OU course before.
>
> Q. To what extent is your comfortableness due to CoSy?
>
> A. Quite a lot. You see you can struggle on your own in a course and think you are the only person who doesn't understand. Summer school is usually the time when you realise everyone is in the same boat. Here you realise that very early on - that people are struggling over certain parts of it. (I,5,S)

Another student commented:

> I don't want to let the modem go [at the end of the year]- that is my link to the outside world. Once I break that connection I sort of feel I am on my own again. It is a psychological as well as a physical break. (I,6,S)

The most common social need which conferencing fulfilled for students was the desire to be 'in touch' with others on the course. Being part of what is going on, feeling in contact with the 'people who designed the course' and alleviating the sense of isolation are all mentioned by students in interviews and CoSy messages.

> CMC has allowed me to share the experiences and to 'listen to' the views of many more students and tutors than I would ordinarily meet at course tutorials. I would think that at this point on the course - just over half way - the CoSy Experience adds up to much more than the

> TOTAL of all tutorials that I have attended on four previous courses. Despite the medium's inability to transmit the smiles (and glares) and other non-verbal speech parts enjoyed in face-face, I still feel more involved and a part of things than I have done on other courses. CMC, as implemented on this course, is one giant step toward removing that feeling of being 'on your own' suffered by OU students, certainly by me. (C,7,S)

The conversation facility on CoSy was also used by students to chat more informally. Fifty-two conversations were set up containing anywhere from 2 to nearly 1000 messages.

> I opened up a conversation with the aim of getting the students who regularly contribute to encourage those who lurk to try using CMC interactively. . . The conversation was called The CoSy Chatline/Self-help Group, and had a very informal atmosphere. We added many students onto the conversation and addressed personal messages to a number of lurkers, in an attempt to give them a gentle push. Not all of them replied, but there were quite a few who started to feel their feet and eventually became as addicted to CMC as the CoSy personalities that Maureen mentioned. (C,8,S)

The value of computer conferencing to OU students was largely anticipated by the course team, though not perhaps to the extent they wished. The lack of sustained interactive discussion about the course was certainly disappointing, but other uses of the system were very positive.

REASONS FOR NON-USE

It would be easy to conclude that the major reasons for the low take up of the medium by the majority of students were: lack of time, the cost of connection and the very small place that the medium was allocated in the course. All

three of these were undoubtedly important factors in this application and potential users in other institutions should not underestimate the power of any of them to lower usage levels. However, careful rereading of all the qualitative data for this thesis - interviews, students' projects, open-ended sections of I.E.T. questionnaires and participant observation notes of students' logons has revealed a more important factor than the first three, namely, the limitations of the medium itself. The more obvious reasons of time, cost and role of conferencing will be considered first.

Lack of time

Lack of time is a constant cry from OU students about their non-use of many course facilities. There are indications that this course - a full credit course specifying 12 to 15 hours of work per week for 34 weeks - was 'overloaded' with readings, text material and new software to learn at regular intervals. By far the majority of students on the course were in full time employment and most were married and had children.

> I found that I had just understood a computer application and then had to move on to another, with no time to consolidate knowledge. In fact, I failed to master the CoSy system and used it as an information tool rather than for communication. (HCE,22,S)

> There is an awful lot packed in, so if you don't move on you get behind. I like the facility of CoSy; I enjoy doing it. I quite like it as an entertainment factor. I like putting in a message and getting a response very quickly. But it is not really helping me get on with the course. (I,6,S)

Conferencing is in many respects a very time-consuming activity: logging on, browsing through messages to find relevant ones to download, reading

through offline and composing a reply, logging on again and uploading the message. Most important is the 'thinking time':

> Q. Do you feel inhibited about putting messages into conferences?
>
> A. My problem is just getting the time to sit down and think about the issues - like the TV censorship debate. I have read it, but haven't had time to really think about what I could contribute. (I,7,S)

The Annual Survey of New Courses, conducted by IET for the University, (Lawless, 1989) shows that the overall interest rating for DT200 was above the 1988 new courses' average, but that workload was rated highest of any of the new courses, and very near the 'too much' level.

Cost of accessing CoSy

Table 5.5 shows the cost of accessing CoSy from the four different telephone charge bands and the percentage of students who fell into each category. The cost of using CoSy for the minimum 10 hours recommended in the course material would be eight times as much for the highest rate as for the lowest rate. Nevertheless, correlations of the database questions on phone band and number of logons shows that students in the highest band did not log on less often - although they did not read or compose messages online as often as students in the lowest bands. The considerable outrage expressed throughout most of the qualitative data about the cost of accessing CoSy seems to be independent of the charge band of the complainer. Furthermore, the interviews revealed two students who both claimed to be logging on about once or twice a week from the same charge band, one of whom kept meticulous records of the exact time and accepted the cost as calculated before the bill arrived, and the other who put a number of messages on CoSy denouncing the whole experiment as financially unjust and impractical.

The following few quotations hardly hint at the extent of the discussion, complaints and outright condemnation expressed over the cost of accessing CoSy.

> The time required to be online to CoSy was far greater than originally estimated and the cost proved prohibitive. (HCE,24,S)

> Phone bills exorbitant. Mine in excess of £100 for the year for CoSy activities. Course should not have been presented until more access nodes had been provided. I should have liked to have made more use of CoSy but was inhibited by costs. (HCE,50,S)

> The cost of going online almost amounted to extortion. I was getting 45 seconds a unit, so in the end I had to give up going online. (HCE,51,S)

One of the complicating factors in this emotionally charged debate is that telephone bills at present do not indicate what amount is data transmission costs from CoSy and what is normal voice use of the telephone. Table 5.2 gives the total student hours online, and shows that two thirds of all students spent *under* the minimum required time online. At evenings and weekends, 10 hours access over the whole course would cost about £5 (local), £18 (*a* band) and £30-40 (*b1* and *b* band). The amount of concern and the depth of anger expressed about the cost of accessing CoSy is, therefore difficult to reconcile with the statistical evidence. To what extent this phenomenon reflects the British context generally, the OU 'socialist' heritage as outlined in Chapter Two, or the distance education market as a whole, is not easy to determine. Some of the evidence suggests that students were not outraged at the absolute cost of using CoSy, but rather the relative cost, which was unequal. This issue above all others shows the value of integrating qualitative and quantitative data.

Charge band	Distance from network node (miles)	Cheap rate per hour (£)	Cost of ten hours (£)	Percentage of students
Local	Variable	0.51	5.10	54.4
Band A	Up to 35	1.82	18.20	25.1
Band B*	Over 35	4.04	40.40	17.9
Band B1*	Over 35	3.04	30.40	2.6

*The B1 rate applies to some frequently used routes.

Table 5.5 DT200 Students by Telephone Charge Bands

Role of Conferencing on DT200

As already indicated, the place of CoSy on the course was one of four software packages, which altogether formed 20% of the workload. Although students were instructed in the use of CoSy in the second block of the course, there were no specific requirements to log on after that. The project, which was to be handed in near the end of the course, could in theory be completed with a minimum of actual use of the system. Indeed, frequent logging on by all students was never envisioned by the course team and regular contributions from all 1300 users would, if the system could actually have stood up to it, certainly have overloaded the conferences by producing more messages than anyone could handle. Had it been conceived as a teaching tool, the whole environment would have had to be structured differently. The following exchange in a student interview reflects the role of conferencing on this course:

Q. I know you have spoken of OU study as a personal challenge - to be able to do things on your own. Does CoSy add to or diminish that sense?

A. Oh, far from diminish it. Although I still like to do things on my own, I looked upon CoSy as a challenge and felt proud that I have mastered it. In fact, I suppose I felt CoSy was a challenge and I had

mastered it and I don't need it any more! Apart from when I am really desperate. I looked on it as an exercise to understand. Perhaps that is why I don't use it very often.

Q. To some extent that attitude is reflected in the way the course is designed. You learn it and you pass on to something else.

A. That's why I was recommending a reference (in the course material) every now and then to remind people they can get help from it. (I,8,S)

The personal reactions of one student described in the project were:

I still feel CMC is rather exciting and extremely interesting and I wish that DT200 had allocated a more realistic work schedule, which would have enabled me to participate in what I believe is a very exciting medium of communication. (P,52,S)

Another student summed up the attitude of her colleagues as well as herself:

A. Lots of technical people are contributing 'solutions', but very few students are contributing thoughts and ideas. That is the disappointing thing about it.

Q. Why do you think that is?

A. Maybe they are thinking, "I should be concentrating on the next block, rather than preparing long messages for CoSy". Maybe they are watching but have decided they don't have time to contribute. There is an awful lot packed in, so if you don't move on you get behind. (I,6,S)

Limitations of the medium

The above quotation from a student interview includes a reaction which was wide-spread amongst the medium-to-low users of CoSy: disappointment. Questions 23 and 24 on the Project Database show quite a high level of

enthusiasm (60%) about computer conferencing before it was available for use. This attitude is confirmed by interview data and comments made by students in questionnaires and on CoSy. From the extensive data available for this thesis, a very clear picture has emerged of the inter-relating factors about the nature of the medium, which conspired to disappoint students and lead to minimal use of CoSy by so many of them. These factors will be described and then followed by a selection of quotations which show the interplay of one with another as seen from the students' perspective.

- *quantity of messages in conferences* - For all but the very frequent and regular users of the system, the volume of messages was very difficult to manage. The tools within CoSy to cope with large conferences - the *skip* command, *list headers* command, *read by reference* and so on - really do not address the problem of the infrequent user wanting to get information efficiently, let alone contribute to a discussion.

- *peripheral nature of comments* - The nature of the messages in the main discussion topics on the whole offered a broader, rather than a deeper understanding of the course issues. Students with considerable expertise in certain areas of Information Technology contributed sometimes long and complex messages which gave a wider perspective on many areas of the subject, but very few messages tackled specific course issues in depth. [1]

- *loss of spontaniety working offline* - The need to read and or compose messages offline for reasons of cost, transforms communication into a tedious and unspontaneous activity for many people.

---

[1] In my experience this is typical of educational applications of computer conferencing - the nature of the medium facilitates interesting diversions, personal experiences, additional information, and discussions which quickly diverge from the original starting point. For this reason I have listed this as a 'limitation of the medium'.

- *lack of impetus to contribute* - The disadvantage of the medium's flexibility to allow users to reflect on messages and a possible response, often leads to their not making a response at all. Face-to-face communication carries a much higher obligation to respond.

- *proliferation of 'irrelevant' messages* - The definition of an irrelevant message is ultimately a personal one, but there is no doubt that many users were put off by the number of 'junk' messages on the system.

- *technical difficulties* - Questions 37, 46, and 47 in the Project Database give an indication of the level of difficulties experienced by students. They were, in fact, rather lower than some course team members anticipated and pilot tests had indicated. Nevertheless, the bugs in OUCom, complaints about the network, totally inexplicable technical failures and odd snags in CoSy due to the large number of users, were hard to handle in the first two months of the course.

The following selections from various sources of qualitative data demonstrate the initial enthusiasm, the disappointment with the reality of conferencing and the combination of limitations which caused it.

> Before we started I had naive visions of vast amounts of stimulating conversations going on, unrestricted by geographical distance or by only having occasional tutorials at which to meet. By and large this has not happened and I have learnt that electronic communication is both hard work and time consuming. There is also concern about social isolation produced by the new technology, the electronic communicator can spend a large part of his or her time physically alone, neglecting the family and perhaps having little time left over for face to face social interaction. (P,53,S)

> Like most of the students starting the DT200 course, I brought a genuine degree of enthusiasm for the opportunity of being able to use CMC

within the course. . .In practice I found that the messages I did send were short because I was aware of the cost of drafting online whilst I found the operations involved in preparing text offline tedious and guaranteed to destroy spontaneity. . . I know you can skip backwards and forwards in reading messages - but you are making the decisions blind. Quite often I jump to the last 10 messages, but I don't know what I have missed. There might have been something really important or really interesting. . . In my own case then, technical, economic and psychological factors meant that I was unable, or unwilling, to use the medium in any comprehensive fashion. (P,54,S)

I liked to log on every Sunday morning when I reviewed our local tutor conference and then other topics relevant to the current block. However, the novelty of browsing through dt200-lounge or even dt200-forum soon wears off {by September 1st, 2778 messages had been stored in dt200-forum alone}. As the volume of trivia grew greater, I found fewer messages of interest. (P,55,S)

Comments made during interviews:

It is like coming into a dinner party right in the middle. You can see people have been talking about something and you feel, 'What am I doing here?' (I,9,S)

I found the early messages in Forum a bit high-flown. I wasn't really sure what they were getting at and what relevance it was. It was in the category of 'nice to know'. It might be quite useful to pick something off there and include it in your assignment. I don't know - to get the full picture you need the comments on the message because that is where the discussion takes place. It can actually take quite a while to get the complete picture and put things in perspective. (I,8,S)

Q. How would you compare conferencing with a face-to-face tutorial?

A. Well I think there is a difference in the sense that the contributions might be the same, but face-to-face you do feel you ought to make a contribution. There is no compulsion like that online. So you aren't getting a 'full' discussion really. (I,6,S)

One student who downloaded a considerable amount of material tried to keep organised files of important material, for instance about a given assignment. He found this very difficult as it required working through the many records of online sessions, copying and pasting messages into separate files, and as the volume grew he had to abandon this effort.

Extracts from open-ended comments on the Home Computing Evaluation survey:

CoSy is wonderful in theory but there were too many options/conferences available and too many frivolous messages. (HCE,56,S)

Many conferences were full of unrelated comments/messages. I tried to follow the flow but got disheartened and gave up on main conferences. I tended to stick to news and our tutor conference, but found other students also fed up so tutor conference also died. (HCE,57,S)

CoSy is terribly boring and far too linear. Some students suffer from writing waffle and incorrect statements are not corrected nor sources corroborated. (HCE,58,S)

I found that the time required to engage in useful CMC outweighed the benefits and therefore I didn't use it very much. (HCE,59,S)

Anyone familiar with computer conferencing and the literature in the field will recognize that none of these difficulties are unique to the OU application. Indeed, they are all limitations of the medium, in its present state of development. Some of them were identified by the Institute of the Future

studies 15 years ago (Vallee *et al*, 1974) - reduced obligation to respond, lack of focussed discussion and of course, technical difficulties. Improvements in the hardware and network equipment promise to overcome some of these limitations, and the next generation of computer conferencing software with transparent on and offline working, non-linear storing of messages and greater personal tailoring capabilities, may well overcome the other limitations. In the meantime, it is important that any application capitalises on the positive features of the medium and tries to minimise its limitations.

The conclusion of this analysis of data is that the combination of these various limitations is, in its present development, a serious deterrant to the successful spread of the medium.

EDUCATIONAL QUALITY OF COSY MESSAGES

The final component of this chapter is a content analysis of one of the Forum topics: Block 4, which relates to the unit of the course on education and information technology. This topic included the most sustained effort of central staff to facilitate an academic discussion of the issues of the course. It is therefore not typical of all the conferences, but rather the most educationally rich of all of them.

As the methodology chapter made evident, the approach of this analysis is to place the quality of what is said foremost before the quantification of messages, contributors and keyword references. Each message was read and reread in order to identify and unravel the various threads of discussion interwoven throughout the 291 messages of this topic. Twenty separate categories were finally discerned, of which one was a catch-all for miscellaneous messages. Unusually few (5) messages combined comments on more than one thread, and so it was arbitrarily decided to assign the number of words to the relevant thread but to count the message twice - one for each thread. Both the number of messages and the number of words in each thread were totalled according to

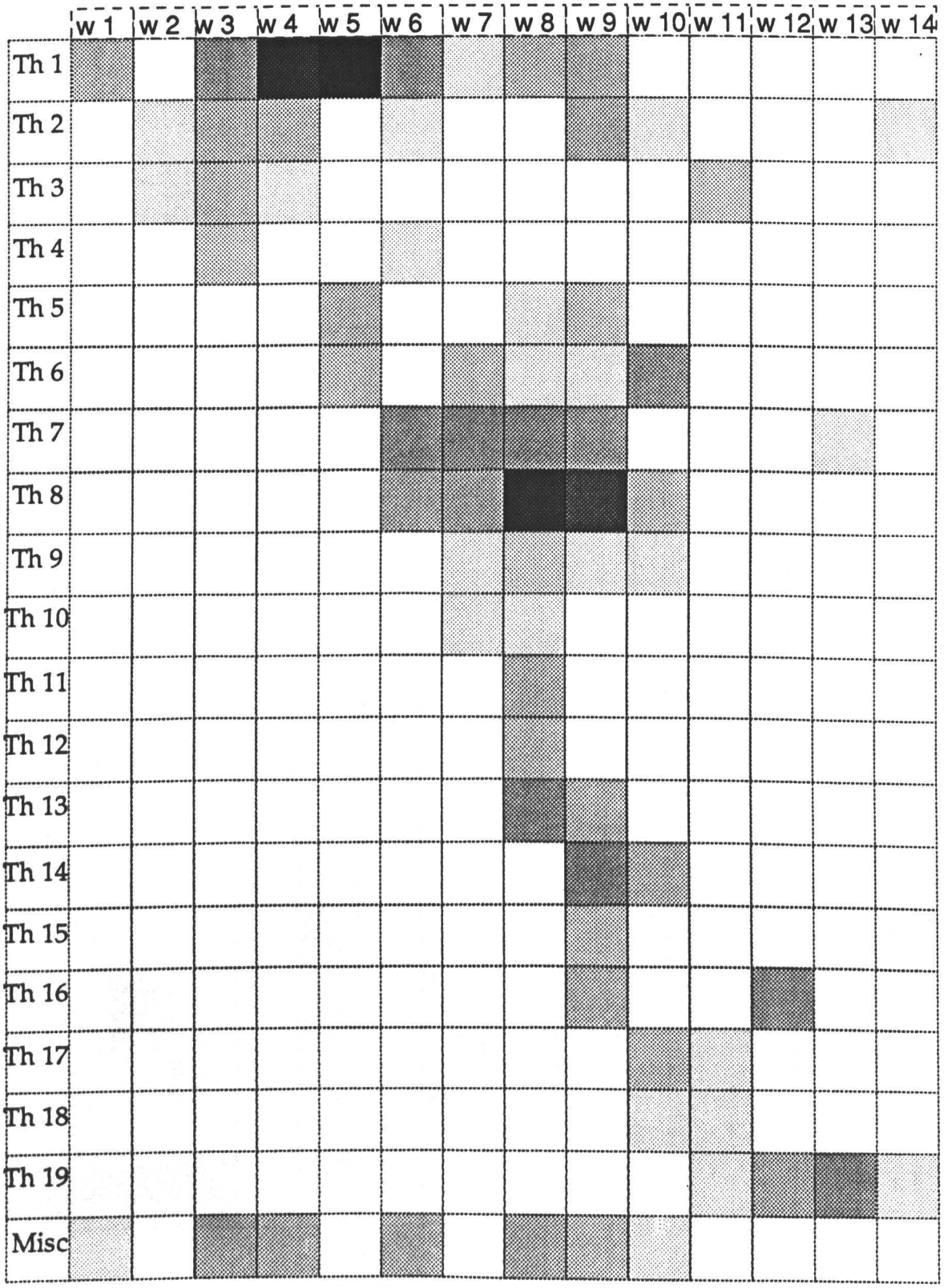
the date of entry. With this information several tables have been generated to provide a base for the description and educational assessment of the interchanges.

First of all, in order to give an overview of the activity in the topic a single page summary of the numerical data has been generated as in Table 5.6. This provides an immediate picture of the flow of discussion throughout the 20 different threads over the length of the course. A block is made up of 4 one week units, and therefore is scheduled to take students about one month to study. This education block fell roughly in the middle of the course - weeks 5 to 8 on the table. One of the major hiccups of the course presentation during 1988 was the late mailing of this (and other) material, due partially to course team tardiness, partially to OU mismanagement and partially to a postal strike. This issue was to form the most heated and long standing discussion of the topic (if not of the whole of the DT200 conferences). As thread 1 on the table, it opened the discussion, contained by far the greatest number of messages (though not the longest in words), was sustained for the longest period and, not surprisingly, was the major thread of discussion during the early weeks before students had received the Block 4 course material. As the issues involved in these interchanges are relevant to the course team, the content of this thread will be discussed in Chapter Seven. The overall picture of activity shows the introduction of new threads, the development of previous threads and the winding down of others. During the two most active weeks of the discussion, weeks 8 and 9, interactions on a dozen different threads were taking place with approximately 50 messages per week in this one topic of one conference alone.

	w 1	w 2	w 3	w 4	w 5	w 6	w 7	w 8	w 9	w10	w11	w12	w13	w14
Th 1	4 238		8 226	20 631	27 2893	8 896	1 114	9 385	4 76					
Th 2		1 488	4 407	3 135		1 187			5 433	1 10				1 36
Th 3		1 472	3 157	1 69							2 199			
Th 4			2 1125			1 125								
Th 5					3 231			1 17	2 49					
Th 6					2 124		2 38	1 234	1 8	6 413				
Th 7						6 502	9 1364	10 945	6 521				1 132	
Th 8						3 207	4 440	24 3283	20 1557	2 71				
Th9							1 330	5 229	1 76	1 83				
Th 10							1 181	1 246						
Th 11								3 202						
Th 12								2 98						
Th 13								6 860	3 280					
Th 14									7 345	3 214				
Th 15									2 433					
Th 16									3 653			6 2140		
Th 17										2 382	1 91			
Th 18										1 61	1 45			
Th 19											1 657	4 1690	8 2458	1 759
Misc	1 153		4 104	3 64		2 22		3 103	2 20	1 26				
	w 1	w 2	w 3	w 4	w 5	w 6	w 7	w 8	w 9	w10	w11	w12	w13	w14

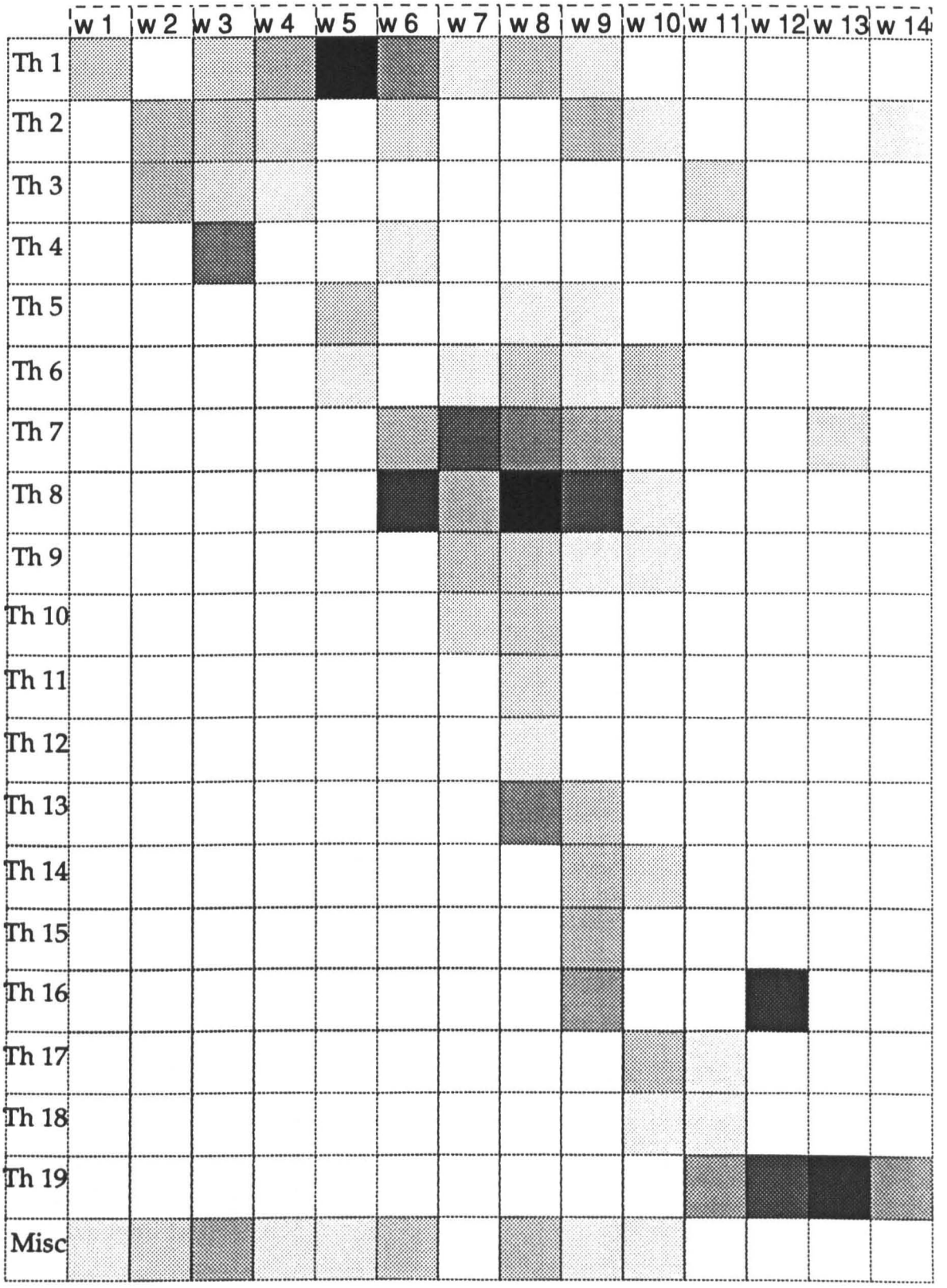
Upper entries give number of messages per thread (Th) per week (w)
Lower entries give number of words in all messages per thread per week

Table 5.6 Block 4 Topic with 19 Threads



W = Week
Th = Thread

Figure 5.14 Number of Messages per Thread



W = Week
Th = Thread

Figure 5.15 Number of Words per Week

The fact that issues other than the 'process comment' of the first thread were eventually established can be seen in Figure 5.14, a density chart of the number of messages per thread. The densest discussion, after thread 1, was thread 8, which was introduced, moderated and followed through by the course team member who coordinated the writing of the associated block of written material. Threads 2,3,4 and 5 were all introduced by one particular student, a teacher with some experience in the material of the block. Similarly, some of the later threads were introduced and sustained with extremely long messages by two other students. Course team members initiated threads 6 and 9, one a 'contest' to identify a quotation, and the other on the educational potential of CMC. In fact, excluding the first and last (miscellaneous) threads, the remaining 18 were introduced by eight different people. This topic, therefore, supports the early discovery by the Institute for the Future that there are two types of participants - those who tend to generate new threads and those who tend to contribute to the development of other participants' threads (Vallee *et al*, 1974).

Figure 5.15 is another density chart showing the number of words input each week. Threads 1, 8 and 19 all have fairly dense shading reflecting a large input of words. However, the nature of these discussions was very different. The first, Thread 1, already referred to as 'process comment' ranged through many subjects: the late arrival of materials, why they were late, complaints against the course team, justifications of the course team, and late arrivals of the next block of material. Most of the messages were short, many referred to what others had said and many different students took part - probably because commenting on personal experience is easier than commenting on more academic subjects.

> Block 4 is going in Milton Keynes mail this week, together with outstanding items from last mailing. (C,5,CT)

Presumably 'outstanding items from last mailing means the TMA 3 assignment. . . which is urgently needed given that the cut-off date for the TMA is fast approaching. (C,20,T)

Exactly! We realise this. However, the gist of it was provided in last Stop Press with this in mind. Production meeting today confirmed final item in, and mailing out today or Thurs., I am promised. (C,5,CT)

And about bloody time! I have a hard enough time with the technology bits without having to wait endlessly for the vital AV notes for the cassettes which, according to the Study Guide, were supposed to have been listened to at various points through the reading, rather than in a rush at the end. I can sympathise with the difficulties of trying to organise a new course, but what about the hundreds of students waiting for the basic materials for our study? (C,60,S)

Thread 8 was a lively, interactive discussion with a challenging proposition by the course team member:

Title: IT and teachers

Right: are you ready for this? A major reason for introducing IT into commercial organisations is to reduce high labour costs. Is anyone out there willing to make a case for using IT in education to replace or reduce the number of teachers? If so, how? (C,10,CT)

The following extracts show how students picked up this 'challenge' and began to develop, collaboratively, some counter-arguments :

IT is already making an impact on reducing staffing levels, but particularly in the area of self-supported study, 'flexistudy' Open Learning etc. But at the mainstream education level, so we provide machines to instruct - who programs the machines? Who tells the

programmers what they are to produce? Who decides the aims, objectives, assessment criteria? . . (C,35,S)

The problem with teachers is that they are a recurrent expense. . .Software and hardware are a one-off cost. . . (C,10,CT)

You seem to assume that software and hardware don't need maintaining and last for ever. When has that ever been the case? (C,43,S)

The perfect program is not a concept which holds any credence. Your choice is fairly simple - - go on paying teachers AND programmers - - between them they may get it and IT right. Of the two I know which we could do without at a push. I'm all for new technology but not at any price. (C,44,S)

A school is also a vehicle of passing on to the next generation the values of the society. . .Teachers do more, much more, than fill the learner with knowledge. If that were the sole task of the teacher, then fine; they could be replaced by machines, although I would even argue that point. . . (C,45,S)

All right Tony! Yes, we can replace teachers - not in all areas, by a careful analysis of the learning situation and the application of educational technology. . . It still requires the educational specialist (ie the teacher) to write the package, to design the learning outcomes, etc. Once produced it can be managed by a non-specialist. However, the skills of the teacher (ie the teacher as a manager) are still of vital importance. (C,23,S)

Messages were longer than those in the first thread, very interactive, but contributed by only seven different students. The course team member who introduced the proposition summarised the arguments at various points and re-focussed the discussion. It eventually led into the area of the latest IT

developments in education. On the whole, these messages were the most relevant, sustained discussion of course issues in the whole of the DT200 conferences. One student more or less announced this on CoSy:

> The discussion on this block has been the best yet (but the block was also the best yet in my humble opinion). (C,11,S)

A number of other students chimed in their agreement.

The third thread, 19, consisted of eight very long messages by one student and comments by six other participants. The subject matter was compact disks, about which the major contributor was apparently somewhat of an expert. One of his messages was an extract from a hi-fi magazine, while others were detailed answers to queries from students, again with selections from various journals on the subject. At the time of this discussion, the subject of 'laser rot' was in the news - the CD expert explained the background to the problem:

> First we were told that videodiscs and Compact Discs would last forever. Then people started to worry about whether the plastics base material would start to disintegrate - for instance become opaque - over a period of time. It's not such an unreasonable idea. Video discs and audio Compact Discs are read by a laser, so they are continually being hit by a powerful light beam. This beam is fine focused by the plastics material from which the disc was made, so it has to remain clear and transparent. (C,46,S)

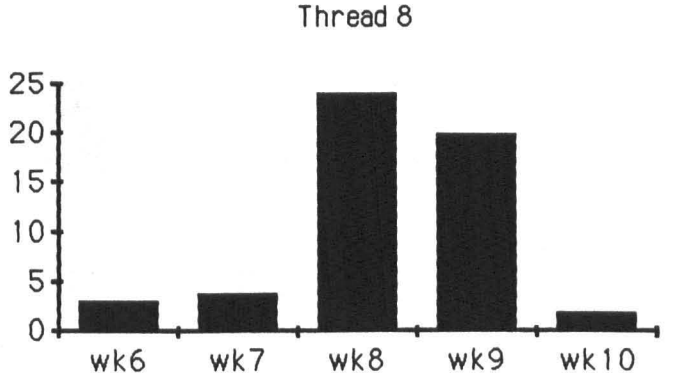
This history of the situation continued for over 1500 words. Another student then uploaded a long passage from *New Scientist* entitled, "Tests Prove CD's can Self-Distruct". The 'expert' added his comments on the article, and referred to some information he had about the pros and cons of digital and analogue reproduction of sound. Several students asked for details and encouraged him with other questions:

> Does the deletion of harmonics on CD affect the sound? I'd be interested in the article you refer to if you have time to reproduce it. I found your previous comments very interesting. . .(C,15,S)

An answer to the question followed, as well as extracts from the requested article, and again totalled over 1500 words. This was met with more questions and thanks for the interesting article.

These three threads, therefore, consist of very different kinds of interactions, and have different educational value. The first thread gave students insight into the fallibility of their teachers, as well as the opportunity to express their personal opinions about their situation as learners and the chance to see themselves in relation to other students. The second invited students to participate in a lively debate which had its roots in the course material. The third thread allowed one student to demonstrate his expertise and the others to ask questions or simply to accept the information as a broadening perspective on the course. All three kinds of interactivity are common in campus based institutions, but a rarity in distance education with its occasional tutorials.

Many of the threads show a standard curve in their introduction, activity and eventual demise. This is the kind of interchange one would expect in a face-to-face seminar.



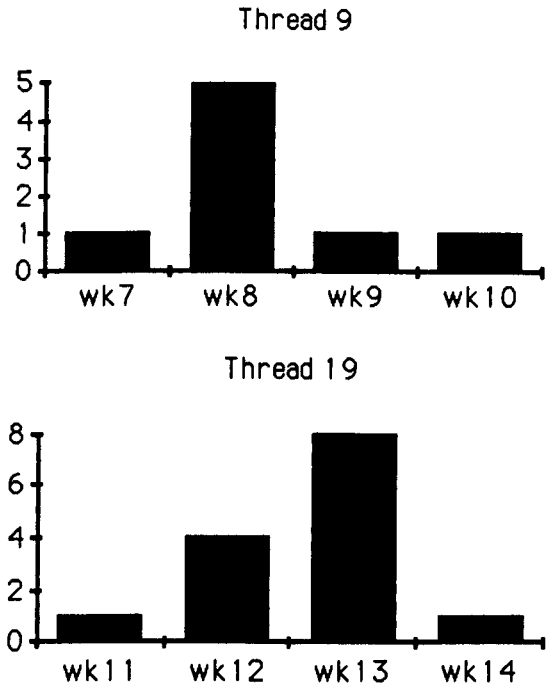
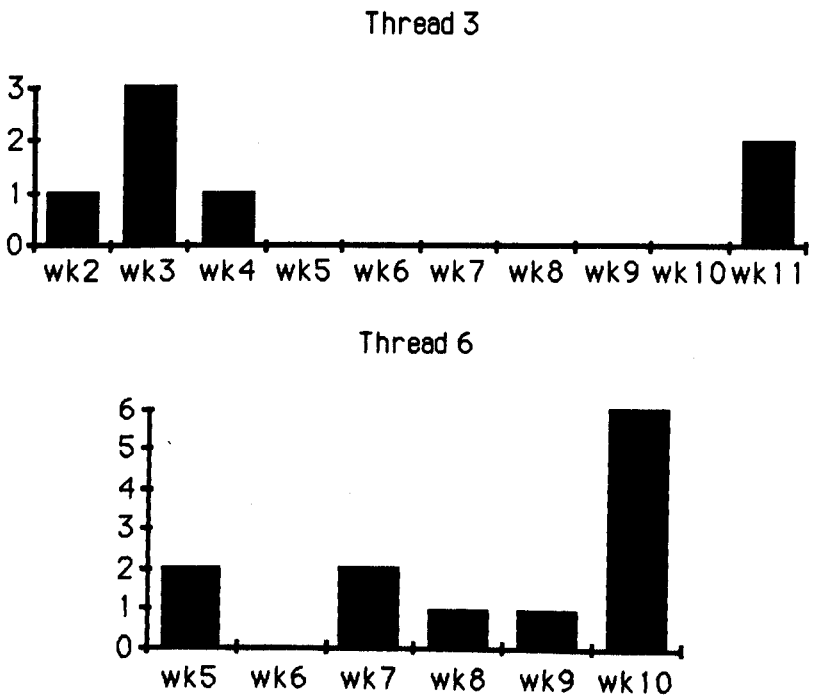


Figure 5.16 Threads 8, 9 and 19

Other threads, however, show quite different patterns, dissimilar to face-to-face discussions. For instance, some introductory messages never develop into a substantial discussion; others can apparently die for several weeks and be revived, and yet others can act like a basic undercurrent throughout, with additions constantly interwoven amongst the other discussions.



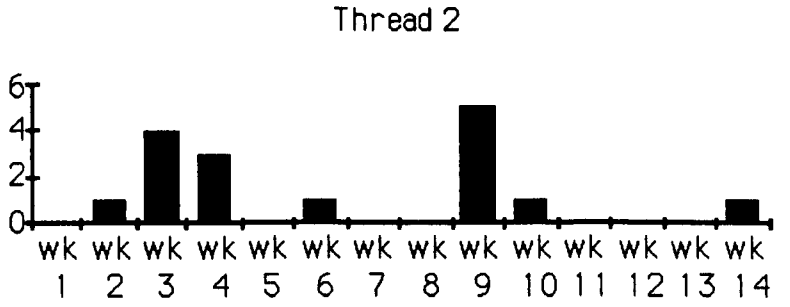


Figure 5.17 Threads 3, 6 and 2

Analysing the factors which cause some threads to develop and others to come to nothing, is not within the scope of this thesis. However, it is worth noting that the threads in this topic which developed over several weeks by the interactions of a number of participants all ranged some distance from the original message. Thread 7, for instance, began as a discussion of the DT200 television programme on interactive video. Though this remained the core of the thread, other OU broadcasts were referred to, as well as other examples of interactive video:

> Regarding TV10's attempt to emulate video-disc, I thought it was quite a good attempt and it certainly gave me a feel for how interactive video could be used. Quite by chance I was able to try a real interactive video briefly at work today - surrounded by some other people. Our conversation was little different from the people in TV10! (C,12,S)

The second thread began broadly with a long entry by a school teacher on the state of computer use in schools, and ended with half a dozen interchanges about super-computers. On the one hand this kind of development allowed students to express their opinions, to bring the fruits of their experience to the discussion and to be exposed to a broader perspective of other people's views. On the other hand, many of the course issues received only a cursory reference, and very few of the threads showed any coherent development or analysis of a subject. As one student said about the Forum generally:

> There seem a lot of people with axes to grind, particular things which interest them which they put into the conference which aren't really relevant to the course at all. Sometimes they are interesting to read. But it is pretty much pot luck - you don't know what you will get out of them. (I,5,S)

Students know what they will 'get out' of the OU printed texts. The 1988 students got 'pot luck' with CoSy. This was both its strength and its weakness.

BEYOND CONTENT ANALYSIS

> I've loved using the system, I really feel I've learned more and understood the aims and objectives better because of CMC and my marks have been consistently higher too, even though I've not put the time I should have put in because I've used the system so much, but I haven't lost anything, far from it. I've gained tremendously, not only in the education aspects, but socially too. DT200 in a way has spoilt me, I am going to sorely miss active discussion whenever I like for the remainder of my courses - it will be like losing my right arm or a friend! (C,61,S)

This comment, and there are dozens in a similar vein, seems at odds with the apparent quality of interchanges on DT200 conferences. Reading through the conference transcripts it is easy to conclude that this student was exaggerating. It is hard to see how CoSy could have been more than marginally educational, let alone be as valuable as a right arm!

The explanation only comes from personal experience.[1] Being part of an active conference generates an excitement and stimulation which is never fully

---

[1]Apart from the many DT200 conferences on CoSy, I have had the opportunity of participating in several international computer conferences, both as participant and guest lecturer. I was very conscious at the time of how infinitely more thought provoking the experience was than the pale reflection of the messages in the conference.

reflected in the words input to the conference. Reading a book or attending a lecture can be stimulating, even exciting, but when interaction with other people is added to the mixture, the experience is heightened to a different dimension. Analysing the transcript of an educational application of computer conferencing is important. But it must be seen as the tip of an iceberg - submerged under the transcript lies the personal questioning, relating and reorganising of thoughts, ideas and information, which is the real stuff of learning.

CONCLUSIONS

The fact that so many students were exposed to this rapidly expanding field of communications technology, and that so many were able to jump over the hurdles of its use, is a possible justification for its place on this course. As a means of overcoming the social isolation of distance learners, it was very successful for a minority of students. It must be noted however, that not all distance learners perceive their situation as isolated, or have any desire to communicate with teachers or peers. Conferencing is a very non-obtrusive medium in this respect - it conveniently provides a whole world of contacts for the making, but is easy to avoid if preferable.

At the level of information exchange the medium was best exploited by the most students: help with the practical work of the course was obtained by many students through the topic 'gremlins' in the open Forum conference; information about assignments, face-to-face meetings and other events was exchanged at the local tutor group level, and an unknown amount of advice and support was received through email. The educational exploitation, while never specifically part of the original intention for its use on this course, developed through the enthusiasm of a few members of staff and a minority of the students. The potential of the medium for extending course material, for student interaction with course issues, and for developing a broader

perspective was demonstrated sufficiently to warrant further investigation by other distance teaching institutions.

CHAPTER SIX: THE TUTOR

INTRODUCTION

The following analysis of tutor data will take a similar form to the presentation of student data: it begins with a discussion of OU tutoring generally and DT200 tutors in particular; the main analysis consists of reasons for use and reasons for non-use of CoSy; the discussion finally turns to answering the research question - is CoSy a successful tutorial medium?

THE ROLE OF THE OU TUTOR

The duties of the course tutor are summarised in OU documentation as: responsibility for the correspondence tuition, face-to-face and at-a-distance tuition of a group of students taking a higher-level course.[1] At the same time, it is acknowledged that the tutor provides the main vehicle for reducing the students' feelings of isolation. *Open Teaching*, prepared for all new tutors by the Staff Development Team of the OU, describes the role of the tutor in face-to-face tuition:

> The main things that tutorials in the OU have to do, then, are on the one hand to diminish students' feelings of isolation, and on the other to offer them practice in the various skills the course requires and a forum where they can tackle together the difficulties presented by the course material. The important point here is that, in the OU setting particularly, these two aspects of tutorials are interdependent. Creating a welcoming, lively, enjoyable social atmosphere in which students can get to know each other is not an end in itself: it is

[1]See for instance the Annual Information for Tutorial and Counselling Staff 1988/89 and Further Particulars for Tutorial and Counselling Staff, May 1989.

educationally effective because it fosters in students the confidence which is essential for productive, peer-supported learning to take place and continue to take place.[1]

Despite the ease with which the tutors' duties can be summarised, a number of ambiguities about the role of the tutor are inherent in the structure and ideology of the Open University, as outlined in Chapter Two. Attendance at tutorials is purely optional for students, yet the importance of face-to-face tuition is a cornerstone of the OU teaching strategy. The role of the tutorial in the original structure of the OU was remedial, yet the ethos of the tutorial over the years has become that of facilitating learning for all students. The tutor is the 'go-between' from the course materials which provide the teaching, to the student, yet the main function of the tutor is the assessment of individual students' work, a process which has always been regarded as teaching, rather than simply marking. These ambiguities are highlighted here, not because they cause conflicts for OU tutors generally, but because they are central to understanding what happened on CoSy and how tutors responded. In fact, the argument developed in this analysis of the tutor perspective grows out of these ambiguities and points to the need for changes in the specified role of tutors.

THE DATA

As no survey questionnaires were used with tutors, the quantitative data for this chapter consists of the computer-generated statistics of tutors' CoSy usage - both the number and length of logons and the number and length of messages input to conferences. The qualitative data is more extensive: interviews with 15 tutors before the course began, and follow-up discussions by telephone and on CoSy throughout the course, observations from attendance at face-to-face

---

[1]*Open Teaching*, The Open University, 1988, p. 55.

tutorials, and all conference exchanges on CoSy, including tutor group conferences, 'national' conferences, and the closed conference for tutors and central staff. The 'log-books' of eight tutors, asked to keep a record of the nature and amount of contact they had with students via the telephone and via CoSy were also available for this study. However, the briefing weekend for all tutors before the course began and the many debriefing regional meetings at the end of the first year provided the most consistent and extensive material on the tutor perspective.

THE TUTOR PROFILE

The 65 tutors who were chosen for the course in its first year had either a strong social science or technology background. Many had experience in both areas. As with the students, the degree of computer literacy[1] before starting was not a predictor of tutors' take-up of CoSy. A number of very technically competent tutors hardly appeared on the system, while others were among the most visible and helpful. A couple of tutors with no previous computer experience never mastered CoSy and subsequently dropped out, while others persevered and offered their students exceptionally good support. One tutor with previous experience of using CoSy for teaching was monitored very closely, and his online activity was certainly amongst the most successful; however, another tutor with no experience either of OU tutoring or of electronic communication, was also monitored, and his tutoring was equally successful.

---

[1]As preparation for the briefing meeting before the course began, I asked staff tutors in each region to give me details of the background and computer experience of all tutors. During the 'hands-on' session of the meeting, I was able to observe each of the tutors learning to use CoSy.

The 15 tutors interviewed, some with previous tutoring experience and others new to the OU system, were asked how they viewed the role of the OU tutor and each one emphasised slightly different aspects of the job:

- representing the university to the student
- challenging the bright, supporting the weak and counselling those with personal problems
- helping to make relationships between ideas on the course
- encouraging them to get through the course and sit the exam
- developing autonomous learners
- creating a group feeling so that students can learn better
- allaying the fears of the technophobics and jarring the 'techies' out of complacency
- helping students through areas in which they are unconfident

The variety of these responses highlights the range of intepretations of the role of the tutor in the OU - teacher, facilitator, go-between, supporter and counsellor.

The most notable fact about the tutors emerged from the interviews (and was subsequently confirmed in larger meetings): the primary motivation of many tutors in signing up for this course was its use of computer conferencing. There was tremendous interest and enthusiasm for experiencing this new medium and for trying it out to teach distance students.

Q. What do you most look forward to in tutoring this course?

A. The main thing is using CoSy, to be frank...In my mind I think it would be great if students felt they could use the system efficiently to

take control of what they are doing - interact with each other or set up small groups to discuss assignments. That's what I would like to see happening. (I,5,T)[1]

A number of experienced tutors began with very high expectations for the use of CoSy:

Q. What expectations do you have about the course?

A. Well, they are pretty high. I've got this optimistic vision that we will all start talking to each other and do very important and interesting things. . . In the traditional system, the students will ring you up and say, I've got this problem and maybe you can sort him out, but it doesn't go much farther than that. What is exciting about conferencing is that it pulls in a wider variety of people and more ideas. (I,4,T)

A. I would like to see it take off, because I think it is good, great in fact. (I,6,T)

A. I have great hopes, yes, because students who ring me up spend a long time trying to establish that it is convenient to talk for half an hour. Once they realise that when they mail me a little bell doesn't ring somewhere in my house, and that it is a very convenient way of asking a question and getting a reply, I hope they will find that both a useful means of communicating with me and with each other. After all, it is quick, it's cheap, it's convenient and it's part of the course. (I,7,T)

---

[1]The same notation will be used for quotations from sources as in the previous chapter: I for interviews, and C for CoSy messages. In addition, each of the 65 tutors will be assigned a different number. The notation ends with a T to indicate that the quotation is from a tutor.

As a cross-section of OU tutors generally, it is safe to conclude that the 65 tutors in 1988 represent a biased sample. It will be interesting to see whether this degree of enthusiasm is maintained in subsequent years of the course, and how the nature of DT200 tutoring changes over its six year life as a result.

Many tutors accurately predicted the way that CoSy would be used by students: the initial chaos, the need for tutors to provide technical support despite the provision of the ACS help-desk, the variable take-up of the medium by students, and the creation of a social environment for learning. Nevertheless, the lack of use made of the tutor group conferences and the relative success of the 'national' forum conference were not anticipated by anyone, though it may be obvious now with hind-sight.

USE OF COSY IN 1988

There was a certain amount of speculation amongst course team members and tutors before the course began about possible mis-uses of CoSy which in fact never became a problem. Some of these fears were fuelled by reports of applications elsewhere; some were specific to those with a strong technology background; others were based on the pilot tests of the material with six mock students. In the event, these fears were unfounded:

- tutors were not overwhelmed with hundreds of email messages
- tutors were not treated as teachers with all the right answers
- the mail facility was not used to the exclusion of conferences
- the whole system neither fell flat through lack of use nor crashed through over-use
- no obscenities or irresponsible behaviour appeared on the system

- particular students did not hog the air space to the exclusion of others, as sometimes happens in face-to-face tutorials.

At the most basic, mechanical level, CoSy did function both as a piece of software for students to experience and as a medium for tutors to interact with students.

DT200 was allocated 14 hours of face-to-face tuition which the course team divided into six hours of traditional tutorials and eight hours of CoSy contact. Students began using the system roughly at the beginning of Block 2 of the course (at the end of March), and had continuous access until after the exam (in October). The course team were reluctant to specify rigid rules for how tutors were expected to use CoSy, but in the end it was agreed that tutors were expected to log on before each assignment was due - this would only be six times. It was hoped, however, that most tutors would log on much more frequently, even weekly - this would amount to 25 times. Tutors were paid a fee for eight hours equivalent face-to-face tuition, plus a reimbursement for 20 hrs online telephone charges.

As with students, the level of CoSy activity amongst tutors varied tremendously, from virtually none to almost daily logging on. Some tutors had free access to CoSy through their place of work, but a number were obliged to log in from *a* and *b* band areas. Table 6.1 shows that 15 tutors did not even fulfill their statutory requirement to provide eight hours tutorial equivalent on CoSy, while 21 tutors spent well over the reimbursed 20 hours online time. The table does not show the amount of time tutors spent offline, preparing material for online use, learning how to use the system or simply reading material down-loaded to avoid online charges. Data from the tutor log books indicates that for every hour online, about the same amount is spent offline, on average. It seems reasonable to conclude, therefore, that 80% of all tutors

did at least 20 hours work (including on- and offline time) on CoSy and 50% spent well over 30 hours.

Mary Thorpe who carried out an evaluation of tutor usage of CoSy in 1988 for the Home Computing Evaluation Project, draws the following conclusion from these statistics:

> Most tutors appear to have been very enthusiastic about this course, and their role in an innovative educational programme. For many people this personal interest (as a professional in the IT area) and enthusiasm has mattered more than just meeting the OU's baseline stipulation for usage. Tutors have read and contributed to conferences especially because they wanted to and not simply because they felt it was necessary in order to help students pass the course. It seems fair to draw this distinction (after interviews with tutors who kept logs of their CoSy usage) notwithstanding the impossibility of separating off completely, 'tutor interest' from 'student success'. (Thorpe, 1989)

hours	tutors	hours	tutors
up to 3 hrs	1	20-30 hrs	6
3-5 hrs	6	30-40 hrs	8
5-8 hrs	8	40-50 hrs	2
8-15 hrs	17	50-100 hrs	5
15-20 hrs	12		

Table 6.1 Tutors' Online Time

The pattern of CoSy use 'evolved' throughout the course. A number of tutors started well before the students in March to familiarise themselves with the system by extensive browsing and discussion in the conference set up expressly for them. Tutors were expected to send welcome messages to all their

students, to post a resumé of themselves on the system and to put opening messages in the topics of their tutor group conference. After an initial flurry of activity, many tutors found that student usage was waning, and that only a minority of students - perhaps 5 to 10 - logged on regularly to the tutor conference. Faced with this situation, some tutors more or less gave up, while others continued to look for ways of increasing student usage and to develop new strategies for coping with the medium. One tutor put welcoming messages in each topic of his tutor conference, and then sat back expecting students to begin discussing the course issues. He was very disappointed that this didn't happen and that by August, his conference was "virtually dead". He opted not to tutor the course in 1989. Another tutor resigned from the very large national conferences and concentrated her efforts on email and her own tutor conference. A tutor whose students all had to access from long distance bands, went to his local study centre every fortnight, browsed through all the national conferences and posted a list in his tutor conference of all the best messages on the system.

Statistics are given in Table 6.2 for three tutor group conferences, moderated by enthusiastic, committed tutors who all spent above the average time online. [1] They show a very high proportion of messages by the tutor (often copied from the national conferences) and a very low proportion by the students.

No. of messages	% by tutor	No. of students	No. who sent 1	2-5	6 messages
1) 78	59%	31	7	1	3
2) 97	55%	30	3	6	2
3) 219	52%	29	3	4	7

Table 6.2 Three Tutor Group Conferences

[1] These statistics are drawn from a study by Castro, 1988.

Table 5.4 given in the last chapter showed the total number of messages in various topics of all the tutor group conferences, as well as the mean and standard deviation. Tutors who continued to input messages - cajoling, informative, chatty or substantial - produced the largest number of student-originated messages. The tutor group conference with the largest number of messages overall was moderated by the tutor who contributed the most messages to the system generally. Several tutors who were also members of the course team and therefore knew the course very well, wrote very knowledgeable and stimulating messages, and their tutor conferences were amongst the most successful in terms of the nature and quality of their students' responses. The conferences with the fewest messages and contributors, were invariably those moderated by tutors who used CoSy for less than the statutory eight hours. The Institute for the Future studies showed as early as 1975 that a computer conference is an unpredictable experience, but is often greatly influenced by a dynamic individual (Valleé *et al.*, 1975). The following extract from a tutor with considerable conferencing flare, describes how this process occurs:

> I have a topical-reading topic, which contains a number of gleanings from the computer freebies, of possible interest and occasional amusement, but not essential for the course. I was hoping this and other topics such as 'chat' would encourage students to try CoSy among their 'town' group before having courage to try the national conferences.
>
> I believe this has had moderate success, since those few of my students who are now contributing nationally started on the town conference, and are still more fluent there. I have tried to make it fun as well, by my initial messages such as on the electronic massaging misprint, and "DT200 students do IT with a modem", but it was all left to me at first. (C,7,T)

As the pattern of 'quiet' tutor group conferences and 'active' national topics became established, the local conferences became the place for information specific to the tutor group - dates of next tutorials or self-help group meetings, friendly chat messages like birth announcements, but most usefully, information about assignments. During the two postal strikes which occurred in June and September of the first year, CoSy proved a vital medium of exchange amongst students and tutors (though not with the course team as will be discussed in Chapter Seven). Many tutors provided a service much appreciated by students of summarising the good and bad points found in each batch of assignments and giving the range of marks for the whole group. Individual students were emailed with their own results. Some tutors joined students from completely dead tutor group conferences to their own conferences and other tutors provided a real time- and cost-saving service to their students by copying the most important messages from the national conferences into the tutor group conference. Students in these tutor groups, therefore, did not need to go beyond their local conference to access all vital information.

The following extract from a tutor's log book shows the CoSy usage of a typical tutor in the first month of the course:

Date	Duration	Content
25/3	28 mins	Putting on résumé
		Answering 2 Course Team messages
22/4	20 mins	Putting up group message on tutor conf
		Reading mail and 'chat' topic
25/4	27 mins	Reading and printing out conferences
		Finding way around CoSy
26/4	15 mins	Checking which students had logged on
		Reading and familiarising
		(MAJOR BREAKTHROUGH - didn't dissolve in tears once, actually could see some value of the facility and almost enjoyed it!)
27/4	3 mins	Changing password
28/4	2 mins	Checking mail and conferences
		Printing out session

Table 6.3 Tutor Log for One Month

For the various reasons described in the previous chapter, many students became increasingly disillusioned with conferencing. However, many of its disadvantages did not apply to email, and consequently, this facility increased in importance. Some tutors used the 'group' mail facility to send email messages to their whole tutor group on matters such as tutorial dates and topics, holiday absences, and reminders about deadlines. The following log of another tutor demonstrates this use of email:

Date	Duration	Content
MAIL		
20/6	3 mins	Student wanting to go to extra tutorial
		Replied with address and tel. no
22/6	9 mins	Bristol student asking permission to use one of my messages
		Message re moving house, late delivery of TMA and telephone costs
		Re non-delivery TMA02 because too much pressure at work
23/6	9 mins	Re late delivery of TMA02 because of birth of daughter
		Re phone bills
		Request to speak to employer re essential nature of having PC for course - replied, agreeing to speak for her
26/6	3 mins	Message to say was on the system - sent welcoming reply
27/6	9 mins	Re phone bills
		Message saying couldn't get into tutor conference. Had deleted himself - rejoined him
		Another first message
28/6	3 mins	Message thanking me for rejoining, going to try Framework instead of OUCOM
29/6	9 mins	Message confirming attendance at extra tutorial in June
		Message discussing topics for next tutorial
		Letter to group about tutorial
30/6	3 mins	Decision to miss out TMA02 and go on to TMA03 because of lack of time
CONFERENCES		
month of May DT200–		Contributed various messages to tut and DT200-Scotland re phone costs, lack of monitoring feedback, lack of information about changed cut-off dates, late tutor notes and late Assignment Booklets

Table 6.4 Tutor Email Log

This tutor used conferencing to keep in touch with fellow tutors in her region, (DT200-Scotland), and with the course team and all the other tutors, (DT200-tut). The short extract from her email log shows how extensively she used this

facility with her students, who were all accessing from the highest call band. Email under these circumstances is clearly the most economical way for students to use the system.

Although email had many advantages, it was not a substitute for the telephone, as Thorpe discovered through interviewing tutors:

> All tutors stressed that there was no substitute for the telephone when students wanted to discuss something they didn't understand or simply wanted a chat. Email is alright for relatively straightforward and uncomplicated messages, but not where the student needs to explore something or to have an extended conversation or question and response. (Thorpe, 1989)

The fact that only a minority of students were logging on regularly, meant that tutors had to continue to send messages to all students by conventional means - letter and telephone. Consequently, using CoSy added to the workload of tutors, instead of decreasing it. However, the potential of computer communication, if regular use could be guaranteed, was appreciated by most tutors, though a few remained skeptical:

> CoSy is not selective enough; everyone is put off by the sheer volume. There should be some hierarchical way of viewing the content. I estimate I've been online 60-70 hours sending things to students, putting things in my tutor conference, but mainly reading online. However, I really don't think students have received any benefit from having CoSy available this year - partly because of cost. (I,14,T)

> It's not a turnkey system like the telephone - in general that works. CoSy is still too caught up in the means and it's becoming an end in

itself. There should be more encouragement to use it - using it for more aspects of the course rather than an extra. (I,24,T)

At the opposite extreme, another tutor writing an evaluation of his first year of using CoSy for an in-house magazine said:

> My expectations of CoSy were very high before DT200 began. For my part the electronic mail system gave me superior access to my students - no longer would they have to ring several times before finding me in or leave messages for me to ring them back. I also envisaged the conferencing system to be a source of recent supplementary material and a forum for debate and for the discussion of opinions about the many issues in the course. And for many including myself all of this happened. (Welford, 1988)

Similarly, another tutor commented:

> Probably about a quarter (of my students) really enjoyed using it, but they can't afford to log on daily. . .I'm very keen to get people to use IT - I would encourage people to use it. It's been fairly successful this year and if refined, it could be more successful. (I,23,T)

Tutors' use of CoSy was, in many respects, similar to students' use: some tutors hardly used it at all, many used it adequately, and a minority were very enthusiastic users. However, the degree of commitment to the medium and the way in which the tutors' used CoSy (for example, primarily for email, primarily for encouraging and supporting the local tutor group conference, or primarily at the national level, giving technical help in the 'gremlins' topic, or opinions in the block topics) had effects on the ways in which students used the system and the amount of their use. Most students of inactive CoSy tutors became inactive users themselves (although a few attached themselves to other tutor groups or involved themselves in Forum); students of active

tutors were on the whole more active themselves. Where tutors copied national messages into the local conference, students did not contribute to Forum topics (although cost was usually a factor in these instances as well). Tutors who used email extensively generated more email from their students. The lessons learned from tutors' use in the first year have led to a variety of changes in subsequent years: dropping tutors who do not want to use CoSy, setting clearer instructions for how tutors should use their online tutorial hours, and finally, because of regional differences, cost inequalities and tutor inclinations, allowing flexibility in how tutors make their primary contributions, whether in one-to-one email support, in their local group conference or at the new regional level.

REASONS FOR NON-USE

Tutors' reasons for not using CoSy were, again, very similar to students': lack of time, cost, and tutor workload. The various limitations of the medium also put off a number of tutors: the lack of structure and hierarchy, the volume of messages, poor telephone lines, the lack of spontaniety in working offline, and the banality of the majority of messages. A number of extracts are given here to expand on the student descriptions of these issues. For example, the following comment details the unsatisfactory nature of working offline:

> In the past I have usually carried out most conferencing online since I have access to JANET at work, and it's relatively easy to spend 10 mins here and there throughout the day 'dropping' into conferences, browsing around spending some time thinking about items in conferences while still online, and responding when I feel there's something I want to say. In the past few weeks I have been working at home, and have downloaded mail and conference items to read offline. I've done this mainly to see what it's like for my

students who are all on non-local call rates and who will probably not spend much time conferencing online.

The effect has been quite dramatic. First of all, a lot of the stuff I download from conferences could best be read online. Very little of it requires to be kept as a hard copy. I also find that the process of reading offline is somehow less involving for me - the items seem to become less immediate, and when there is something to comment on or say, the gap between reading and going back online makes me less inclined to do so. (C,5,T)

The cost of accessing the system, and the limited time which tutors were paid for online work are the main factors in this extract:

As far as costs are concerned, I estimate that it is costing me about 15-20 pounds a month to use the system as a positive teaching mechanism. This means that the allowance will cover half my costs this year. I do think that this should be clarified to tutors next year before they begin. I would be interested to hear what other tutors say, but I really doubt if we can use the system positively at less than an hour a week, and much more at certain times of the year eg. when the student start coming online and need the encouragement of almost instant response. (C, 16,T)

For tutors with considerable computer experience, such as the following, the 'immaturity' of conferencing software is fairly off-putting:

When I first experienced CoSy, I was horrified by the whole system. From my point of view, if I had to use it in its naked mode, I wouldn't use it. I do actually use OUCOM. I would not use CoSy without it, because I simply cannot work my way around the system.

> It is far too cumbersome as far as I am concerned. It is a horrible piece of software. (I,1,T)

The amount of time allocated to conferencing was a limiting factor for tutors as well as for students:

> My main concern as a part-time DT200 tutor is time rather than operating costs. In order to cope, I have had to be systematic about allocating time between the different responsibilities which go with the job. This means of course, setting priorities. (C,17,T)

The picture of use and non-use, of enthusiasm and rejection, of potential and limitations, is therefore very similar for tutors as for students, and broadly speaking, the proportions in each category are about the same. Chapter Five showed that student use of CoSy could very roughly be divided in thirds: little or no use, adequate but mainly lurking use, and finally, enthusiastic and extensive use. Table 6.1 shows that tutor use is similar, but more than a third of tutors were in the middle category and less than a third were in the little or no use category. The question which must now be addressed is whether this medium is appropriate for conducting tutorials.

COSY AS A TUTORIAL MEDIUM

DT200-tut, the closed, unlisted conference set up for discussion amongst tutors and the course team, contained a topic expressly to elicit tutors' opinions about CoSy as a tutorial medium. Long and very incisive views were aired in this topic by 17 of the tutors. This data, as well as many other comments scattered throughout CoSy conferences, constitute the major source material for the following discussion.

The ambiguity in the role of the OU tutor, whether a teacher or simply supporter, and the purpose of tutorials, whether for revision or extending

learning, is heightened on this course by the use of CoSy. This is because computer conferencing was very quickly appreciated as a powerful medium for teaching, as well as for providing support. The role of CoSy on this course - partly for mastering a piece of software, and partly for replacing face-to-face tuition - contributed to the ambiguity. As course software, CoSy was obligatory; as tuition, it was optional. Finally, the very small percentage of time and marks allocated to its use combined with the high expectations and pressure to increase participation fuelled the confusion over its status. Remarks from tutors clearly indicate these ambiguities:

> Is the intention to truly encourage the use of CoSy as a tutoring tool, as opposed to a means of communication now and again, and a form of 'magazine reading'? I think a lot depends on what the ultimate aim of the course is - to actually teach through the system or more simply just to help the student get a feel for and understanding of computer-mediated communication and its potential across a range of applications. The latter is fairly easily achieved; the former requires a lot more resources than are currently being made available. (C,18,T)

> If it is agreed that CoSy is a key feature of this course, rather than just an appendage to the course that could be severed if necessary, SOME APPENDAGE is all I can say! I for one would support a move in the direction of the former since I believe that this system has considerable potential for continual support of 'distance learning' students. (C,19,T)

The low profile of CoSy within the course, as well as the inadequate funding for tutors to do more than provide minimal support mitigated against its use as an effective tutoring medium.

> I am very enthusiastic about CoSy as a teaching tool; it seems to me to have a great deal of potential. But I have to say that as presently set up, it is frustrating in the extreme. As someone else said it is like being given an Audi Quattro as the firms car and then being given a mileage allowance of 10 miles a week and told to pay your own insurance. . . I think CoSy could be a marvellous distance learning/teaching medium with implications beyond the OU, but only if the mechanics of it are thought through more thoroughly for succeeding years. (C, 16,T)

A number of tutors felt it was far too early to evaluate its effectiveness, and that its application on this course would make it difficult to determine its effectiveness as a full-blown tutorial medium.

> In terms of conferencing as a learning tool, it's also rather early to tell what 'effectiveness' looks like; it is just so different from other media. (C,13,T)

> Up to now our local conference has not taken off as a means to discuss the course content. Its main use has been for practical problem solving and TMA feedback. So there are difficulties in evaluating ones ability to use the system as a teaching medium. (C,20,T)

> My routine is dominated by my need to get the students using the conference BEFORE I can distance teach them. . . I can not answer the question of effectiveness yet. (C,10,T)

Evaluating any system in its first year of operation, especially at the OU, must take into account the 'first year phenomenon': tutors in 1988 obviously had to spend time learning the system and devising their own strategies for using it. To a great extent, tutors in the first year were learning along with students.

Extensive changes to the 'architecture' of CoSy (by introducing regional level conferences as the main discussion area) and increasing the allocation of marks for using CoSy on subsequent years of the course will undoubtedly offer scope for a more complete evaluation. Nevertheless, a number of key issues were raised by the first year's experience to lay the groundwork for further discussion: whether student use should be 'compulsory', what the tutorial structure should be, and which tutorial functions it serves. These are discussed in turn:

A selective or compulsory medium

In its role as a piece of software for students to master, CoSy was clearly a 'compulsory' part of the course. In its role as a substitute for face-to-face tutorials, it was technically optional. Although this was never made explicit, the data shows without a doubt that students picked it up implicitly: over 95% logged on at least once and responded to Coco's welcome message, while only a third participated in sending conference messages. Add to this third the number who read conference messages and the statistics are roughly in line with the 40-50% attendance at one post foundation tutorial per year within the OU system.

> Perhaps this will always be a SELECTIVE medium; as with telephoning or face-to-face tutoring, only some students will want or be able to take part, and maybe we're expecting too much to think it will be all of them. (C,2,T)

However, as a selective medium, tutors felt that CoSy was advantaging the verbal and wealthier students, and many were unhappy about the general acquiescence towards conferencing becoming an optional, selective medium:

> I have come to feel over the last few months that CoSy is reinforcing the distance between the very able and articulate students who are

already using the system and making it work for them, and the less able students who are still battling through Block 1! If CoSy is meant to be a teaching method it threatens to be a teaching method for enthusiastic tutors and able students. There is a risk that it will be little used for the less able. (C,16,T)

It seems to me important that all students feel equally able to access the system, not just those who can do so free from work or who are wealthy enough not to mind the cost. (C,20,T)

Does it matter that CoSy is becoming selective? or is it another way of benefiting the wealthy and clever once again. I am certainly guiltily conscious sometimes of spending a lot of time on those who DO come online with queries and ideas and reacting extra-sympathetically to them, feeling I know them as people, and so perhaps neglecting or not taking enough account of all the work and insight of those who don't use CoSy. (C,2,T)

I feel that CoSy has been monopolised by a very few students and tutors. . . We may accept this and say that it is in the nature of the medium, I feel very strongly that we should be devising strategies to encourage more widespread participation and making CoSy a really OPEN medium of communication rather than the elitist one it threatens to be become. (C,16,T)

It is curious that the terms selectivity and even elitist, which are applied by some tutors to CoSy, are never used in relation to face-to-face tutorials. Yet the latter certainly consume as much University resource, are attended by about the same numbers of students and favour the verbally articulate in the same way as CoSy advantages the textually literate. Furthermore, the distance to tutorial locations is as 'unequal' as the local call access areas to CoSy. Be this as it may, it would be a mistake to compare CoSy with face-to-face tutorials, as if

they are interchangeable media. One of the aims of this case study is to articulate the tutorial functions which conferencing has fulfilled on DT200 and to indicate the areas in which conferencing has offered unique opportunities.

The question of whether to make more online work compulsory is very contentious within the course team after the 1988 presentation: should students be led by the nose in this way, should adult learners be treated like this, and would it not be counter-productive in this kind of medium anyway? These issues continue to occupy course team meetings and discussions amongst tutors and central staff in DT200-tut. Reports on subsequent years of CoSy use on DT200, where various compulsory and non-compulsory options are being tried, will doubtless contribute to what appears to be an on-going debate.

A tutorial structure

The tutor group conference was envisaged as the area in which tutors would conduct online tutorials. Topics were pre-set for each block of the course and tutors were given written advice about how to moderate educational discussions. When these proved to be an almost complete failure, tutors were left with little direction or scope for providing online tutoring. About 10 of them began to contribute extensively to Forum conferences, offering advice and practical fixes for technical problems, and giving opinions and personal reactions to student complaints and queries. The remainder either read the national conferences, but confined participation to email and their local conference, or withdrew to very infrequent use.

> It's not an effective tool yet, but it's coming - difficult to know precisely what we are supposed to be doing with CoSy. No doubt each tutor is adopting a different style. (C,21,T)

Examples of some of these different tutor styles are presented in the following. In many respects they reflect the experience, personality and interests of the particular tutor, but they also exemplify three typical kinds of conferencing interactions: short exchanges on technical matters, longer messages expressing opinions about matters only tangentially relevant to the course, and finally 'process' comments about conferencing:

•*Technical Matters* One tutor with exceptional expertise in computer networks, daily free access to CoSy and enthusiasm for supporting students through this medium, generated the most messages in his tutor group conference. These were almost invariably on the practical aspects of the course, and were of such value to students that he received many requests from outsiders to join his conference.

> Could NOT record or transmit files over the direct link. Very frustrating as I actually tried to join in a conversation. (C,47,S)
>
> The problem you have is that you were online at 1200/75 baud, I presume. You were sending at 75 without problem but the VAX was echoing to you at 1200 with problems. The only real (short term) solution is to use 300/300 baud. (C,22,T)
>
> If I copy Keybuk.exe on the OUCom boot up disk and put the name keybuk into autoexec.bat file will this change the position of the " to its proper place and not cause some kind of foul up anywhere in the CoSy system? (C,48,S)
>
> Yes, you should have keybuk.exe on all your boot disks and keybuk in all your autoexec.bat files. I do not know of any problems caused by doing so. (C,22,T)

These messages tend to be short, factual and to-the-point; their value extends well beyond the student who made the original query.

•*Tangential Issues* Another tutor with a strong interest in encouraging openness in learning and self-directedness in students, used his tutor group conference to discuss topical issues which would encourage participation and open debate. A few lively discussions did take place, although they only consisted of three or four thoughtful interchanges.

> I was alarmed at the recent BBC decision to withdraw their controversial programme on Northern Ireland. This amounts to a form of censorship by the government, and would be similar to the course team vetting every message before it was put on CoSy. (C,25,T)

> Aren't there some kinds of things which can't be put on CoSy - advertisements, obscenities etc? You may not feel that this programme falls into the unacceptable category, but surely you agree that the BBC must have a code of conduct, just as CoSy does? (C,49,S)

These kinds of discussions contribute to the more intangible benefits of membership in a university.

•*Process Comment* A third tutor whose conferencing style tended to be very direct, often full of veiled sarcasm and pointed attempts to get students to respond, repeatedly questioned his students about CoSy and their attitudes to learning.

> Can I ask a question? Why do you, and that means all of you, feel afraid to make a contribution that could be seen as wrong. ie why are you worried about speaking before you have 'the knowledge'? That is what many of you have said, that you will not say anything that might seem to be a little silly. That makes me angry, yes very cross! Who is out there standing in judgement? It certainly is not me and there are no marks for the most erudite contribution! Why are we

all here if not to learn? Why do you think all learning should come from the 'official' source, be it the OU, the course units or me? Why are you so hard on yourselves as to think that 'you' have nothing important to say that may be of interest to others? (C,14,T)

This style did provoke some students to respond, but only on the subject of CoSy use, not on other issues.

I feel that I have to comment on your message. Drawing on my own experience rather than other peoples writings I would suggest that technology rather than attitude is the reason for the poor use of CoSy.

I have noticed no reluctance for students, who are strangers to each other, to discuss problems at tutorials. This suggests that communication skills are not lacking, and therefore it is the medium that is restricting. . . At a tutorial, topics of common interest are established, discussed, and resolved in a matter of minutes. Contributors are able to see the value of contributions by the reaction of others in the room. It is a skill we have all developed since birth. Conferencing contributions are thrown out into a void; many get no response; making a contribution is very time consuming and of unknown value. It is not surprising that with all the pressure on time that the course imposes that conferencing has a low priority. (C,50,S)

Whatever the tutor's style, the amount of sustained discussion of course issues in the tutor conferences was almost negligible: those tutors who tried to engage their students in discussing a particular topic found that there was never a critical mass of participants to carry this kind of interchange. The discussions which took place on the national Forum conference have been analysed in the previous chapter - on the whole these were valuable for the broader

perspective they provided, rather than for any sustained, in-depth tackling of course issues.

There are indications that this kind of interactive, focussed discussion of block material is taking place on CoSy in the second year of the course. Although the evaluation is not yet complete, it appears that the introduction of a regional conference level with about 200 students and 6 or 7 tutors taking turns to lead the discussion has provided the structure and the right critical mass for the teaching and facilitating role of tutoring to work in this particular application. Finding the right number of participants who generate a suitable number of messages is obviously a significant factor in the success of any application. The opportunity to adjust these parameters over successive years of DT200 presentations will provide further valuable research data for other applications.

Tutorial functions

In the absence of a clear model for carrying out online tutorials, the majority of tutors used CoSy to capitalise on the supportive aspect of their role.

> This is a very good way of contacting and helping students. I certainly enjoy using it and have made a number of useful contacts with students. (C,22,T)

> Some of my students have really appreciated it - its made them feel less isolated and given them quicker feedback on assignments. (I,23,T)

CoSy was also used effectively by some tutors for the general administrative and information exchange aspects of their duties.

> The most appreciated value of CoSy on DT200, as far as the majority of staff and students were concerned, was the new speed and ease of

getting and sending crucial administrative types of information in all directions. Some examples were: warning students about late dispatch of course materials and revising assignment submission dates; notifying tutorial meetings and examiniation dates; reporting on errors in course material, software and audio-tapes as soon as they were identified. (Castro, 1988: 8)

My feeling about CoSy is yes, that it is expensive, slow and can be downright annoying but, as I gain competence, I am beginning to see the possibilities for it, but as a communication medium rather than as a means of imparting much learning. (C,11,T)

The 'remedial' function of the original face-to-face tutorial was one of the more successful aspects of the use of CoSy in the first year. The value and extensive use made of the 'gremlins' topic of the Forum conference has already been mentioned in Chapter Five. Tutors as well as students contributed advice, fixes, information and support for the many queries logged in this topic. The project and tma topics, where students aired their difficulties with the assignments also served as a vehicle for remedial tutoring.

One of the less commonly acknowledged functions of tutorials is as a platform for students to air grievances, to let off steam and generally express the emotional element in learning. CoSy rose to this challenge admirably. As noted earlier, the medium of computer conferencing seems to attract emotional outbursts. A particularly good example of this will be discussed in the next chapter, but there were many cases of students expressing their pent up frustrations with the course, with studying and with coping with the OU.

Whoever allowed this course to be given the title DT should be shot, it should have been entitled DDDDDDT. The number of marks given in TMAs to the technological content are laughable. I feel that I have been conned into taking this course, I had been hoping to

> progress and complete a good Honours degree. The only way that I can now do this is if I can strike this fiasco from my record. Before I get too personal towards members of staff, maybe I had better quit. (C,25,S)

Interestingly, this 'flaming' message was picked up by another student and turned around:

> I think this course is brilliant. It's about INFORMATION TECHNOLOGY and the course title fairly reflects the course content. How can you learn about the social implications without knowing some of the technical aspects. It all depends where you are coming from. The person who feels they are wasting a year should have applied for a Computer course - there are plenty on offer. Information Technology is all about the application of computers and telecommunications - not necessarily about programming. (C, 26,S)

There is some evidence to suggest that computer conferencing is a better medium than face-to-face tutorials for this 'expressive' function. With many more listeners and possible reactions, and the time and space distancing of the medium, these outbursts can relieve frustrations, and expressions of personal inadequacies can bring sympathy and encouragement. However, the medium can also exacerbate arguments, turning simple misunderstandings into public show-downs.

The tutor group conferences give examples of the way in which the medium acted as a focus for the group, and gave a friendly face to the course. The previous chapter referred to the value of conferencing in overcoming the isolation of distance learning. The following student comment puts this in the context of the tutor group conference:

> Enormously time consuming, expensive, lacking in intellectual content and used only for chatter - I know. But although in previous years I've never been aware of feeling isolated, the prospect now of going back to the old system next year frightens me a little bit. I personally almost never contact my tutor by phone, partly because the answer to my problem is always there in the course material if I only look for it, and partly because of concern that he or she will be just sitting down to eat, or just putting the kids to bed or whatever. Tutorials are usually fully organised, without a great deal of time for spontaneous casual discussion (no criticism).
>
> So, although conferencing is nothing at all like I expected (dazzling intellectual exchange), it does bind us together as a sort of group - David {the tutor} very much included. (C, 27,S)

Thomas (1989) has identified a number of other tutorial functions which CoSy could fulfil even within the confines of the DT200 application. Many of these would be 'value-added' services which are not presently part of normal tutor responsibilities. For instance, model answers to assignment questions could be posted on the system after the closing dates (something students have requested frequently); students could send outline copies of assignments to their tutor electronically for comment before final drafts; tutors could play a much greater part in the design and maintenance of courses by communicating electronically with the course team; and cooperative assignments and team teaching/tutoring are made possible 'at a distance'. All of these activities were tried, albeit in very tentative or informal ways, during the first year.

DIFFICULTIES WITH CMC FOR TUTORING

There are two major limitations endemic to the use of this medium for sustained, interactive, educational tutoring: the labour-intensiveness of the medium, and the students' apparent resistance to the active learning mode. Both of these problems were experienced and discussed by tutors in the first year. Both have been acknowledged and commented upon by the main researchers in the educational applications of computer conferencing (Hiltz, 1988, Harasim, 1989a).

A Labour-intensive Medium

The particular parameters which influenced the design of this application of the medium will be discussed in the next chapter; here it is important to note that computer conferencing generally, and online tutoring in particular are highly labour-intensive. The asynchronicity of the medium is frequently lauded; the other side of the coin is the need for immediacy. As regular and frequent feedback is *possible*, it comes to be *necessary* for the communication channel to work. For tutors to log on once before every assignment is due, is hopelessly inadequate and denies the nature and value of the medium.

> I have found that it's the time factor that is really problematical and I have relatively little time to read and reply to many of the messages that I would like to. The use of CoSy for 'tutoring' can be much more labour intensive than the occasional face-to-face tutorial and I don't believe that due allowances have been made for the comms medium if we are really intended to use it fully. (C,21,T)

Furthermore, the efforts of the course team to encourage offline working, in the interests of cost reduction, led to increased amounts of work for tutors replying to students through email.

> I am already finding the non-use of online facilities frustrating. My students are beginning to send email messages to me and to contribute to conferences (great). These I print on the screen, then leave CoSy, then ouprint them, then consider answers (or whatever) then prepare answers, then upload files and delete original mail. This may be cheap on telephone time but loses all the advantages and immediacy of the online conferencing facilities and is very consuming and frustratingly inefficient on my own use of time. . . I am a great believer in the power and value of online conferencing but I wonder if our concerns to reduce tel costs seriously undermines its values for both students and tutors. (C,11,T)

Because computer conferencing makes communication so easy, and has such potential for a range of tutoring functions, both the standard and new additional ones, the medium demands more time and skill from tutors than traditional OU media. Because it offers many of the services that place-based education gives, it begins to demand the kind of labour required by face-to-face teaching. Computer conferencing can make distance education much more like campus education, but possibly at the price of undermining its cost advantages.

Student Resistance to Interactive Learning

The passivity of students and their inability or unwillingness to participate actively in discussion is an educational issue which has a long and venerable history of research and analysis (see for example, Bouton, 1983, Bligh, 1986). For obvious reasons, this issue is of vital concern to the use of computer conferencing as a tutoring medium.

> Most students are used to instructional designs that are based on either completely individual activity, or competition. The

> widespread practice of 'grading on a curve' emphasizes competition and penalizes students for helping one another. When faced with an instructional design which calls for them to work with others in a cooperative or collaborative manner, particularly if they are expected to play a 'teacher-like' role such as giving criticism of draft papers, many students are resistant. They may also feel that any grading scheme that makes their performance and grade dependent on collaborative work with others is 'unfair'. Finally, many students apparently place little value on the opinions of their peers. (Hiltz, 1988: 111)

In this extract from the Virtual Classroom Report, Hiltz is discussing this question from her experience with undergraduates at a place-based campus. As mentioned in Chapter Three, studies at Guelph University concluded that computer conferencing is more successful with graduate students, as they tend to be older, more serious about their studies and therefore more willing to engage in educational dialogue (McCreary and Van Duren, 1987). OU students are older, and need to be highly motivated to work at a distance and amongst the competing demands of home and job. Was passivity a significant feature of the OU application?

Unfortunately there is little concrete data to refer to in addressing this question. Lack of experience and opportunity to be an active learner are compounded by shyness and the inevitable uncertainties when confronted with a new medium. Furthermore, in conferencing jargon, 'lurking' is a common phenomenon irrespective of the nature of the application. Nevertheless, the tutors frequently referred to the problem of whether and how to draw their students into debate:

> I really don't know about the high level of lurking, yes its there but I find it slightly irritating, almost as if the students are using me. I feel

> that they are being too passive and that they are like great vacuum cleaners of knowledge sucking up all the little tip bits. I am inclined to think that it is because they have adopted a student stance, have become purely passive learners. Perhaps the way they use CoSy is as much to do with the education system as anything but that is one of the angles that I am working on, trying to challenge their assumptions about what a student should do and what a tutor should do. . .(C,24,T)

Some tutors felt it was not their duty to 'force' students to take part in discussions, and that it was counter-productive to try. One tutor thought that participation could be fostered, but it required a careful approach:

> I don't think it's necessarily the limited software that can be blamed for the banality and unstructured nature of the conferences, it is the sheer effort that is necessary to engage in such a 'written' conversation. As Nick Heap pointed out (#3), it is hard to draw a direct analogy between face-to-face dialogue and computer conferencing, it's more like potentially rapid circular letters. And we are all familiar with the problem that many people have with letter writing! Yes, indeed I believe that they can get into the habit, but it needs careful fostering not Skinnerian shaping (the rewards are too tenuous initially for that!). (C, 19,T)

This extract relates the question of passivity with another long-term conferencing issue: keeping a discussion on track and focussed on the original subject. As has already been discussed in previous chapters, conferencing is very good at broadening issues, but less appropriate for in-depth discussion.

Varying degrees of 'fostering' of discussions took place in the conferences. The most prominant example is the tutor who used email 'behind the scenes' to congratulate new contributors, to provoke other participants to reply to

messages already in a conference, and to encourage lurkers to make an initial contribution.

> Have you read message 30 in the block topic yet - what do you think about Ian's attitude to EPOS? With your job experience, I thought you might have some useful comments to make. (C,26,T)

Another tutor, who was also a member of the course team, responded immediately to any requests, opinions or questions in the Forum conference, with long, thoughtful and directly relevant comments.

> To me DT200 is mainly concerned with SOCIAL issues about the actual application of modern IT rather than Technical questions. (C,50,S)
>
> It is possible to study IT, to write about IT, and even pass exams in IT without getting into the technology. It is possible to write a very good answer to TMA03 without getting into the technology. But in general, students should not expect to get high grades in TMAs or the exam without some display of knowledge of the technology.
>
> It may be that students who are bemoaning or enjoying the apparent dominance of social science are unaware of how much technology they have already learned. . . I would recommend that students should make sure that they know key technological concepts like packet switching, modulation, and multiplexing by writing their own notes elaborating on the definitions of such terms given in the Glossaries in the light of study of other parts of the course materials.
>
> When such key concepts are part of your soul you will write much better social science type essays about IT. (C,3,T)

Tutors' concern about passivity in learners contrasts with the opinions of students on the matter, as a number of them put up a positive case for the value of lurking or social uses of the medium:

> I have gained confidence as the year went on because, if I got stuck, it was highly likely that someone else had already entered comments which were relevant. This has been the greatest bonus for me and I can fully understand why so many browse or lurk in the system. The information is so readily available for all. I've spent a fortune in phone bills but it has been worth every penny! We really cannot assess just how effective CoSy is but there are absolutely no doubts in my mind. (C, 28,S)

> I personally, though not contributing very much to CoSy have found answers to problems with practical work. When stuck over a problem, I could log on and try to find a solution. (C, 29,S)

> One can simply log on for a chat or to let off steam or to share an excitement (how are the new arrivals doing?). I believe such social contact is necessary if one is to maintain interest and enthusiasm on the course; and maintaining interest should be the first priority of any learning situation. (C,30,S)

> Another avenue I'd like to see explored is a 'lurker's charter'. There seems to be a general idea that people who lurk are somehow 'failing' or not pulling their weight. I think lurking is a more complex and interesting activity, and I'd like to see us explore some of the positive aspects of lurking. What benefit do lurkers get, for example. How does lurking benefit other participants? (C, 31,S)

The issue of passivity, and its relevance to computer conferencing, is clearly one that needs considerable investigation and further research. The greater

the use of the medium for the discussion side of tutoring, the more significant this issue becomes.

CONCLUSIONS

To conclude this chapter on the viability of computer conferencing as a tutoring medium, the following conclusions can be drawn from the OU application:

- As a vehicle for discussing course issues, it is useful for broadening and peripheral perspectives. It is much more difficult, though potentially possible, to provoke sustained, interactive analysis of specific course material.

- As a method for exchanging information and conducting administrative duties, it is very efficient and effective.

- As a means of providing practical support to students, particularly on technical matters, it is an effective use of tutor (and student) expertise.

- There is a direct relation between the amount of moderating activity of tutors and the vitality of conferences.

- The usage of CoSy in 1988 shows a similar pattern to attendance at OU post-foundation tutorials.

- The social atmosphere created through computer conferencing for learning, for overcoming isolation and for expressing emotions, is very positive for some, though by no means all students.

- There appears to be a gap between the expectations raised by the medium and the actuality of using it, resulting in a sense of disappointment and sometimes frustration.

- Use of the medium in an optional or self-selected mode renders many of these functions less effective, as it increases tutor work-load and reduces the necessary critical mass of participants.

- Tutors often regard lurking as a passive form of learning which should be discouraged; students report advantages of merely reading through conference messages.

- The medium demands a more labour intensive approach to tutoring, which increases costs and requires greater tutorial allocation than is usual in OU courses.

- Participation in conferencing can be encouraged through various fostering techniques or pressured through compulsory means - the value of the latter is not yet proven.

CHAPTER SEVEN: THE COURSE TEAM

INTRODUCTION

Discussion in the previous two chapters has highlighted the difficulties which sprung from particular elements of this application: its small stake in the overall course, its dual role as software to be mastered and partial substitution for face-to-face tutorials, and its introduction near the beginning of the course, but optional use thereafter. With the benefit of considerable analysis, feedback and evaluation, it is easy to see these elements as obvious sources of a dilemma. Why was this not obvious to the course team during planning and production? How could they have used such a powerful tool in such a tentative way? The simple answer is: it did not look like that at the time. Minutes from monthly course team meetings over three years, as well as those from the practical working group, the tutorial working group and the project working group, have all been consulted in making this analysis.[1]

DEVELOPMENT OF THE APPLICATION

Ideas for a course on information technology were discussed 'over coffee' by several of the key instigators for a time, until firmer plans and possible course team members were assembled during 1985. According to the course team chairman:

> From my point of view, comms was always going to be there, otherwise there was no point in having a course on IT. Because IT is about telecommunications as much as it is about storing and processing

[1] I was also a contributing member at all these meetings during this period as well.

information. And to deny students the experience of telecommunications would defeat the whole object. . . (I, 1,CT)[1]

The earliest documents and outlines for the course confirm this view, that a communications facility was a requirement for the course from the start. However, the purpose of the facility was described as giving practical experience of IT systems and demonstrating technological issues, such as ASCII code, baud rates and compatibility.

When potential course team members were asked to submit a written statement of their interest and possible contribution to the course, the two members from I.E.T. formalised the tutorial aspect of the communications facility:

> I would like to contribute material on the ways in which IT can be used to improve dispersed education/training at a distance eg. networking as a tool for enabling communication between trainers and trainees, computer conferencing and electronic mail for training/education etc. . Practical Work: Group work in using the communication facilities on the course itself for a training/educational project, and its use to prepare and submit an assessed piece of project work. (Tony Kaye, 1.12.85)

> Teaching methods and course production: I will only be interested in working on this course as a full member of the course team if it is committed to experimenting with information technology itself for delivering and tutoring this course. (Tony Bates, 17/09/85)

The outline proposal for the course sent to the Courses Committee in August 1985 simply listed computer conferencing along with the other software which

---

[1]Quotations from members of the course team will be annotated in the same way as before, but the designation 'CT' will be added at the end.

would be required in the practical work. The course team meeting of November 1985 to discuss the proposal records the following amendment:

> 4.1 The need to consider 'process' as well as 'product', ie. the use of IT to make interaction with and between students (and perhaps also Course Team members) more fruitful eg. via computer conferencing, electronic mail. This process in the actual delivery of the course was not explicitly enough emphasised in the proposal but was fully accepted in principle by the Course Team with the proviso that the detailed mechanisms still need exploration.

Using a communications facility in a course on Information Technology has obvious scope for giving practical experience of running terminal emulation software, of file transfer protocols, and a variety of other technological issues. Using a communications facility on *any* course has obvious scope for improving and extending the links between disparate people, creating an opportunity for group work, and facilitating interaction and serendipitous encounters. These two uses are perfectly compatible in theory, as long as both are properly supported.

The technologists on the course team provided the expertise and experience for tackling the inevitable problems with introducing a communications facility on such a large scale to novice users. The first priorities of the course team were to choose a modem, test the dial up nodes of the network and design the front-end. The protracted decision-making process within the University to stipulate the specifications for the Home Computing Policy, and the difficult negotiations over software put all the hand-over dates for the practical units well behind schedule, and these and a variety of technical hitches dominated early meetings, and distracted the course team from what can be seen with hindsight are more vital issues: the integration of the two aims in introducing a communications facility, and the balance of the various 'ingredients' of the course.

Further discussion, however, could not have circumvented the major stumbling block in several vital aspects of the application: lack of financial resources. The very earliest documents indicate a concern over the differential costs to students accessing the network, and repeated and concerted efforts were made to provide local call rates to all users. The costs involved in each of the various avenues explored were considered too great by the University. Negotiations continue, and ACS has given it 'highest priority'. In the meantime, the high cost of telecommunications must be seen as the 'price' to be paid by the pioneers and innovators in this field.

The effect of the ACS report in 1987 stating that local call access could not be extended to all users was critical: the course team agreed to minimise compulsory work using communications. Thus, the seed was sown for much of the ensuing dilemma. Logging on and mastering the medium became the 10 hours of compulsory practical work in Block 2 and all subsequent use was left as optional for those who wanted and could afford to access it.

A similar stumbling block was encountered in the tutoring element of the application. The ideological underpinnings of the introduction of CMC as an educational medium for OU students were eloquently laid out in a short paper to the Tutorial Working Group by the main proponent and catalyst for computer conferencing on the course team:

> For obvious technical and financial reasons, almost all OU teaching up to now has been based on quasi-industrial principles of division of labour and segmentation of responsibilities: students learn, tutors tutor, counsellors counsel, course managers manage, unit authors write units, maintenance team maintain courses, and so on. When a course is actually running there is often very little communication between these various actors; at times one wonders what happened to the educational process.

> Without claiming it as a panacea, it seems to me that we could use information technology to provide channels of communication which can open up and enrich the educational process in which we involve our students, and make it qualitatively different to that on the standard OU undergraduate course. This is why I would prefer to discuss ways of *supporting and enriching student learning* rather than *tutorial provision.* The latter term implies, to me, that we are still thinking in terms of segmented roles - ie. only of what *tutors* might do, and then only what they might do in their *tutorial* role. (Tony Kaye, 13/11/85)

Inevitably this 'vision' of how CoSy could be the means of moving away from the industrialisation of distance education, had to be translated into a tutoring strategy to be submitted to the Teaching and Counselling Committee, which approves tutoring arrangements for new courses. In November of 1986, a paper was submitted to the committee, suggesting that 8 of the 14 tutorial hours be allocated for online work and that payment of 20 hours telephone costs be made. It went on to say:

> Tutors will be asked to log in once a week routinely in order to read messages sent to them. It is especially important for students that they are encouraged to use this form of communication by knowing that their tutor will normally read and respond to them within a matter of days, not weeks.

The committee, while endorsing the innovation generally, expressed concern over the demands on tutors and requested exact details of the contractual obligations of tutors to use the system. They noted that tutors seemed to be expected but not contractually obligated to use conferencing for participating in conferences like DT200-tut.

Though various means were investigated for increasing the payment to tutors, the course team was eventually obliged to fall in line with the usual

provisions for second level tutors, and to stipulate a minimum requirement for tutors' online duties. Reluctantly, it agreed to the notion of tutors logging on before TMA due dates, although it emphasised that this would be regarded as a very minimal performance. Despite good-will on all sides, therefore, this innovation was relegated by financial considerations to a small corner of the course and confined in large part to an optional status.

These institutional difficulties in pioneering new technologies are hardly unique to DT200, nor even to the Open University, although this particular case is a classic of its kind. The following extract from a study on the introduction of new media in higher education sets the DT200 experience in context:

> The main barrier to innovation lies in the nature of existing educational institutions. Their decision-making structures have evolved to protect the existing system, protecting not only existing academic departments, but more importantly existing administrative structures, both of which need to change radically if new technologies are to be successfully integrated.
>
> Let me give an example: the introduction of new technology usually needs a fresh injection of capital, and recurrent costs to operate. Sometimes, it will lead to savings in the long-term, but in the short-term, in an increasingly common situation where resources are fixed or even diminishing, innovation can only take place by robbing Peter to pay Paul; in other words by cutting an existing budget to provide funds for the innovation. (Bates, 1985: 13)

The perspective of the course team during the production phase before 1988, was coloured by a number of anxieties, as indicated in Chapter Two: technical difficulties, instructing at a distance, the conceptual model of conferencing and the inexperience of tutors. The most pervasive feeling, however, was of

setting out on completely uncharted waters - would the system be embarrassingly underused or overwhelmingly overused? Computer conferencing for distance education was untried in Britain, and computer conferencing for mass education was untried anywhere in the world. Furthermore, during the planning years of 1985-7, there was very little precedent for using the medium as a tutorial support. Course team minutes record the following comments:

> One of two things could happen:
>
> - they don't use it, we all carry on doing things as usual, and the idea is deemed a failure
>
> - they use it enthusiastically, and overload the tutors, course team members, and ACS; the course grinds to a halt, and the idea is dropped as being nice in principle, but too expensive to run in our current financial situation. (Tony Kaye, 13/11/85)

The strategy of a compulsory portion to teach the mechanics of the system, and an open-ended, optional portion for tutoring and general communication, seemed at the time to be a sensible tack to take between the Carybdis of too little use and the Scilla of too much.

The other concerns of the course team were handled as follows:

• *technical difficulties* - Concern over the technical difficulties which students would encounter was fuelled during the developmental testing of the practical work, prior to finalising the printed units. Several testers experienced repeated difficulty in making the connection to the network, such that there was a last minute proposal to scrap the OU designed front-end and use only the public domain communication software, Kermit, so that the source of the connection failure could be more easily identified. This was vigorously opposed by those who considered that a user-friendly introduction to the medium was essential

to its success. In the end, the matter was resolved with further changes to the teaching material to support Kermit for those in difficulty with OUCom.

• *instructing at a distance* - The burden on the teaching material to convey what can be so much more easily demonstrated face-to-face, was felt very strongly by those involved in preparing it. Teaching practical work at a distance involves a different dimension from presenting ideas or theories - lack of clarity leads not just to misunderstanding, but to inability to proceed further. It became increasingly clear during the writing of the instructions for using CoSy, that it was impossible to predict and account for all the possible mistakes that naive users could make. The idea of providing a rudimentary diagnostic matrix was developed, which included a list of resources to consult with each problem. A cassette tape was central to the strategy to 'talk' students through the first few logons, and explain the features of the front-end.

• *conceptual model of conferencing* - The available literature on computer conferencing applications indicated that one of the major problems was social/psychological: encouraging students to interact in a meaningful way in an unfamiliar environment. To address this concern, several topics were set up for students to practice the art of conferencing - 'junk', for sending and withdrawing messages and 'lurk' for learning the unwritten code of conferencing etiquette. The Electronic Campus, Figure 2.1, was devised and included in the teaching material, as a way of providing students with a conceptual model for understanding the nature of the medium.

• *inexperience of tutors* - Various experienced colleagues in computer conferencing were aghast at the OU's plan to use 65 inexperienced tutors to moderate conferences. As a result, notes were prepared for tutors at the weekend briefing meeting before the course began, summarising all the available research and advice on moderating educational computer conferences. A topic was set up on DT200-tut for tutors and staff to discuss the

issues of moderating, and a very lively and stimulating debate ensued before the course began.

These concerns are described here to give a picture of what issues the course team was discussing and how its perspective was influenced and made manifest. This discussion also shows the kind of care and attention paid by the course team to anticipating students' problems.

Figure 7.1 presents a model which summarises the general characteristics of the implementation process. Institutional and technological factors led to certain course team decisions, which in turn affected the users' attitudes and overall experience of the medium. As will be shown in the remainder of this chapter, the reactions and comments of students and tutors, fed back to the course team largely through CoSy, led the course team to make changes and to rewrite material accordingly. Furthermore, the course team, backed up by student experiences, has begun to influence institutional policy.

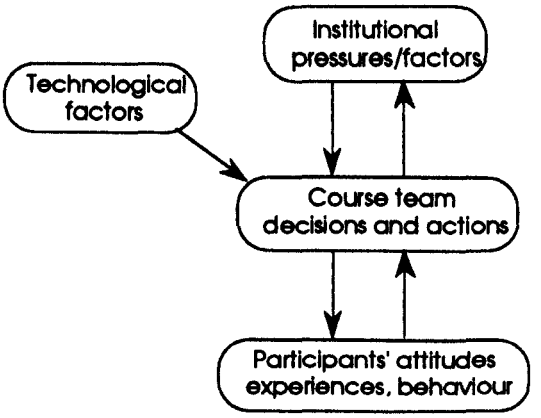


Figure 7.1 Characterisation of the Implementation Process

Figure 7.2 shows in more detail how the technological and institutional factors distorted the original intentions of the course team.

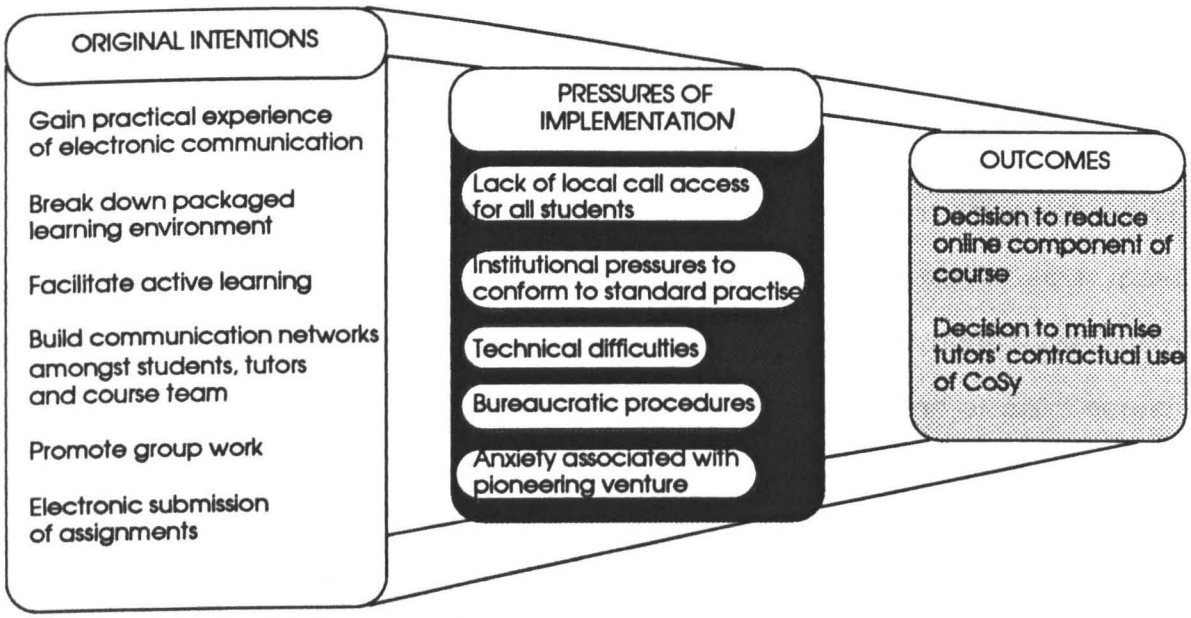


Figure 7.2 Key factors in the Design of Application

PRESENTATION IN THE FIRST YEAR

Events during the 1988 presentation of the course show both that some of their concerns during production were justified, and also that there were other matters which should have concerned them, but were somehow overlooked. Perhaps the most galling fact of all is that the major worry - either of underuse or overuse - was borne out in both respects! The national conferences were overloaded with messages, and yet a third of students hardly used the system and another third did not use it interactively. Neither of these was serious enough to call a halt to the exercise, and steps have been taken for subsequent years to mitigate the worst of these extremes. [1]

[1]These have been mentioned in previous chapters: the introduction of regional conferences to relieve the burden on the national conferences and to increase the participation level, the addition of marks allocated for evidence of a conference entry or mail message, and the funding of a super-tutor for each regional conference to manage and moderate the discussion. Statistical data from the 1989 presentation shows that 75% of students read or participated in their regional conference.

As the production course team, responsible for writing the course materials, gave way to the maintenance course team, with fewer members to maintain the course over its six year life, there was a gradual increase in the time and energy devoted to the communications facility. The minutes and agendas of many of the monthly course team meetings throughout 1985-7 record little or no mention of anything related to CoSy. During the 1988 presentation year, the difficulties with using the system as well as the feedback about other course issues which was being aired on the system, meant that there was always some discussion about CoSy at meetings. By the end of the year, as preparations were being made for the second presentation, matters concerning CoSy came to dominate all course team meetings. Issues could be explained to students via CoSy, evaluations of changes to the course could be carried out on CoSy, and difficulties and misunderstandings could be picked up from student messages on CoSy. This wholesale revolution in the duties and perspective of the maintenance course team can be attributed to the power of the medium. One of the experienced OU tutors noticed this change through tutoring DT200, and wrote a summary of his reactions, appropriately entitled, "Zen and the Art of Course Maintenance":

> The 'old' model whereby central staff may receive the odd critical comment from a tutor or student, which could be easily rationalised as being 'odd' in all senses of the word, has been rudely shattered. Any errors of omission or commission are likely to be made instantly public. . . Certainly some central staff worked tirelessly to respond to queries and comments, and in certain areas CMC added a valuable extra dimension to the teaching and learning process as a whole. This level of commitment will be expected and demanded each year. Central staff will be judged not just upon the quality of the initial material they produce, but also how far they service it (through for example CMC) and, perhaps most importantly of all, the quality of the support they give to deliver the course. (Brown, 1988)

The unglamorous job of course maintenance was suddenly under the full glare of the spotlight. How did the course team cope with this?

Some of the considerable difficulties experienced in the first few months of the course can be absolved by the infamous 'first year phenomenon'. [1] Bugs in OUCom and oversights in the printed material, discovered by the guinea pigs of the first year, have been corrected for subsequent years. Tutors' complaints about their lack of preparation for the skills of moderating have receded as they become more experienced with the medium. More efficient mechanisms have been developed for handling the software for different kinds of machines. Nevertheless, the general lack of management for CoSy in the first year was a major oversight of the course team, as the next section clarifies.

MANAGEMENT OF COSY

The minutes of the August 1987 course team meeting record that a question was raised as to who would be responsible for the management of the conferencing system, and that there was a need to decide who from the course team would be responsible for coordinating the team's views. This crucial matter was never properly discussed and apart from this single mention of such a need, it did not impinge on the concerns of the course team. An ID, called coco, was set up as a channel for dispensing course team views, for inputting stop press items and other important information in the read-only news conference. However, four or five staff had access to that ID, on the understanding that they would take turns dealing with all the mail, and each be able to put in vital messages to the news conference as the need arose.

It was never envisaged that one person would or could manage the system. The quasi-industrialisation of the OU accounts again for this perspective. The

---

[1] It is a well-known piece of OU folklore never to take a course in its first year of presentation.

production course team consisted of many different staff - academics, ACS representatives, editors, course managers, BBC producers, consultants, and a variety of other people, all of them with differing degrees of committment to the course and varying availability to participate. Even the core members of the team had expertise in different aspects of the course, such that online queries about CoSy, OUCom, the printed instructions, the network, the project database, the other software packages, the course schedule and dates of mailings, not to mention particular course issues all required a different person to respond. However, unlike a fully industrialised situation, OU academics are not subject to strict line management. Contributions to course teams and participation in activities such as CoSy operate very much on a voluntary basis. About half a dozen staff responded in various ways to the demands which CoSy introduced, but many student problems fell between their individual expertise and sense of responsibility and committment. This quasi-industrial situation had advantages and disadvantages: it meant that experts were available online and their efforts and dedication were the result of personal enthusiasm, not assembly line responses; however, the lack of strict managerial procedures led to oversights and gaps in provision, and at times, pure mishandling of the situation.

Hiltz and Turoff had noted in their seminal work in 1978 that:

> Communication is the fundamental process by which interaction among the elements of a human system takes place; it is the exchange process by which goals are formulated, decisions made, and 'work' accomplished. It is inevitable that changing the form of communication used by the members of a group will affect the goals, interactions, cohesion, productivity etc. of that group, and their relationship with the rest of society. (Hiltz and Turoff, 1978: 258)

The usual form of communication between course team members and between the course team and tutors or students, was ponderous stop presses,

memos, and indirect contact through staff tutors. The unprecedented ability to communicate so directly and so quickly with students and tutors caught the course team unprepared and uncoordinated.

One of the effects of this lack of management was that important items of information were not always funnelled through the DT200-news conference. Responses to technical queries containing solutions to various annoying or incapacitating hitches were 'hidden' away in the overloaded gremlin topic, where only the very frequent users kept up to date. Eventually it became apparent that the important fixes and advice scattered throughout the topic should be summarised and presented succinctly in DT200-news where it would be easily accessed by less frequent users. The 500 messages in the topic were analysed, the solutions tested and a coordinated view of the best available advice was presented in DT200-news. It required considerable effort, and was not repeated - although by this time (June), most of the bugs had been discovered.

The course manager often had information which should have appeared immediately in DT200-news. In response to the late mailing of course material containing notes on how to answer the next assignment, the course team chairman made a last minute decision to postpone the deadline for the assignment. The course manager mentioned this in the block 4 topic of Forum where students were complaining vigorously about the late mailing. The following message was posted by a tutor in DT200-tut:

> Given all the reminders we get about putting things in the RIGHT CONFERENCE, I would have expected to see the announcement of the alteration of TMA03 submission date in DT200-news. Especially since that is where all other info relating to this ill-fated TMA was posted! I looked there 3 times from Sat to Thurs for confirmation without any luck.

Since both I and my students, along with many others, are swamped with volumes of conference data we have resigned from most as a self-defence mechanism. We therefore look to DT200-news to give us a short summary of important information ie. the CoSy equivalent of a stop press! If the alteration of a TMA submission date doesn't count as news I don't know what does?

I would NOT expect such an announcement to be hidden away amongst the plethora of info in the general forum. I log on fairly regularly, given constraints of time and money and it took me near enough an hour to find it!

Annoyed From Scotland! (C,25,T)

After this justifiable outburst, the chairman copied his next important messages into a wide variety of topics to make sure they were seen by everyone. This too provoked complaints from regular users who were paying many times over to read the same message.

The course team was also slow to use the system for what it is so well suited: immediate notification of information to all users. When students kept asking for the assignment notes, explanations appeared by the course manager about why and how they were late. Eventually one course team member thought to key the two pages of notes into DT200-news, but by this time, the TMA was almost due and the assignment had to be postponed by a week. This is an example of how slow the course team was to use CoSy for providing what no other media could.

In a sense, the introduction of a communications facility has redefined the notion of what is 'important information'. Traditionally, students are notified of crucial changes or mistakes by a stop-press announcement sent to everyone on the course. To warrant this expense, the information has to be of significant importance. With computer conferencing, the ease with which it is

possible to contact everyone gives rise to the expectation that it will be used for whatever someone considers important.

Despite the lack of an overall management strategy, many course team members individually made great contributions to the quality and vitality of the system. Many of the 1200 replies to Coco's welcome message were answered personally, to the utter astonishment and delight of students. Other members wrote detailed responses to the course issues which were raised, weaving together the technological and social elements. Technical problems were handled by several members, who spent long hours trying to replicate students' reported difficulties. ACS members gave very quick replies to all queries about the network, CoSy and the remote database. These responsibilities evolved organically in response to the need and the new opportunity.

A much more organised approach to the management of CoSy in the second year has built on the team approach which evolved naturally in the first year, while improving the coordination of vital information. First of all, the core maintenance team is itself in close touch electronically. Secondly, one course team member, who is also a tutor, acts as coco, and can usually answer all queries himself. Thirdly, ACS now has responsibility for all the course software and specific people who know the course well, handle all the help requests. The most notable difference, however, is the greater cohesion amongst the key participants on CoSy - students, tutors and course team. CoSy is *the* communication medium of the course - it is where "goals are formulated, decisions made, and 'work' accomplished" as Hiltz and Turoff predict (*op. cit.*). In fact, late mailings plagued the beginning of the second year of presentation, but queries and complaints on CoSy about these were handled immediately as a result of the improved management procedures, and so never grew to the scale of the first year, described in detail below. Furthermore, the maintenance team now uses DT200-tut to devise the

assignment questions for the following year with tutors, and to acquaint them with the evaluation reports on the use of conferencing on the course - both examples of new facilities which conferencing offers. These developments indicate that conferencing was used in a 'horseless carriage' mode in 1988 - mimicking the traditional communication patterns and facilities of face-to-face meetings, telephone and mail. As the application develops, the unique features of electronic communication are making themselves apparent.

BLOCK 4 AND THE POSTAL STRIKE

The extended debate about late materials in the block 4 topic of Forum (thread one in the Chapter Five analysis), encapsulates many of the issues involving the effect of this medium on the course team, and is therefore presented in some detail. The 81 messages of this thread were interwoven amongst the 19 other threads in the topic, and formed a continuous harmony of process comment for the melodies of the other threads which concerned the course issues.

Anxious queries from students began at the end of May about the late delivery of block 4 material and the notes for TMA03 assignment. The course manager responded with almost daily reports on the status of the mailing. The first note of criticism, however, was sounded by a student on June 1:

> And about bloody time! I have a hard enough time with the technology bits without having to wait endlessly for the vital AV notes for the cassettes which, according to the Study Guide, were supposed to have been listened to at various points through the reading, rather than in a rush at the end. I can sympathise with the difficulties of trying to organise a new course, but what about the hundreds of students waiting for the basic materials for our study? (C, 60,S) [*also quoted in Chpt 5 content analysis*]

On the 7th of June, the course manager announced that the postal strike in Milton Keynes would further delay the mailing and that the TMA due date would be postponed for a week. Many students expressed their relief at this extension. The course team member responsible for producing the block pointed out that he had not received a copy of the block 4 material himself. By June 13, however, messages began appearing about lack of information on the mailing.

> Why doesn't someone from the course team put something on CoSy to say what is happening to Block 4? We're back to using a crystal ball! (C, 33,S)

> Are all the assignment dates now going to have to be changed as a result of the delays? After all, the whole course timetable is now up the spout. Could someone please offer some advice for those of us who are worried about keeping to tight timescales? (C, 34,S)

Another course team member took the trouble to find out exactly what was happening and put in an explanation and a novel suggestion:

> As far as we know Block 4 is either in MK Post Office or on its way to you. The strike at MK ended yesterday, but there is a big backlog of mail.
> . .
>
> These are all indirect indications of when Block 4 might reach you. Will whoever is first to receive the mailing post a message here? The rest of us can then be more hopeful. (C, 3,CT)

On June 15, the first of three 'flaming' messages appeared from students extremely annoyed and critical of the OU and the course team:

> I've been a student of the OU long enough, and have heard the same story over and over again about new courses. Well I suggest that if you cannot afford to send split mailings because of the cost why don't the

OU get rid of some of the dead wood that is obviously part of this so-called course team. . .

If you were running any sort of business, you would be done under the trades descriptions act! Have you ever heard of TQM? It stands for Total Quality Management.[1] I suggest that the lot of you get yourselves on it. . . The postal strike must have come as a gods send to cover up the real reasons why you are in such a mess. Why don't you use words like : incompetence or inefficiency to describe the shambles you are in?

. . . I would like to urge all fellow students to write a letter of protest to the Senate of the OU complaining at the total ineptitude of the organisers of DT200. . . Having put a lot more than the normal amount of time into block 3, in an effort to get ahead, lo and behold the TMA notes turn up on CoSy after I had virtually completed my effort! Whats more, the cut-off date has been extended. Talk about moving the goal posts after the game has started!!(C, 35,S)

On the same day, the first triumphal message arrived from a student who had received the block 4 mailing. Others followed shortly thereafter.

It's arrived! Block 4 triumphs at last. A welcome tatty brown envelope arrived this afternoon. Mother and protégé doing as well as can be expected. (C, 36,S)

However, the response to the strong words of the three flaming messages developed throughout the rest of the thread. Firstly from students:

My impression is that the OU does rather better than many - even when hog-tied by industrial action in the postal services. At least DT200 has

---

[1]This subject was one of the issues discussed in the course material.

provided a second means of communication - which HAS been used. (C,37,S)

I don't honestly think that there are many around who feel as m-johnson feels. Please don't think that the vast majority of us really {don't} appreciate how difficult a new course must be to bring in. (C, 38,S)

then from a tutor:

When you are on a tight budget the slightest unexpected problem can cause delay and any method of avoiding this is costly. At the moment money is the one thing the OU does not have and if you want to have an upset free first year the only way is to do courses in the second year. (C, 22,T)

from a member of the OU staff who had nothing to do with the course team:

Incompetence or Inefficiency - my god, I hope they never make you Prime Minister. This is a University pal, or hadn't you noticed? We /try/ to run it like a business, but you must remember that courses only exist because /academics/ write them. You can't hurry that process, even if you do make managers and give them cow-pokes to prod the thinkers with. . .

I don't know how much of your message was a wind-up, or whether you really are the humourless thing you come over to be. If it was a wind-up, well: that's cool. If not, I hope you are feeling a little bit better today. (C, 1,member of staff)

Some students also commented on this use of CoSy for venting personal feelings and frustrations.

The block 4 coordinator, who was facilitating the discussion of the other course-related threads running concurrently with this[1], put up a long and detailed explanation of the late mailing and the current financial situation of the OU, which began with:

> First of all, as block coordinator and on behalf of the course team, I would like to apologise to all students for the delay in sending block 4. I would have apologised earlier, but it has taken me most of the week to find out exactly what went wrong. (C, 2,CT)

and ended with:

> Errors have been made in getting the materials out to you in time, and I do apologise for that. Can we now, however, use this part of CoSy primarily for discussion of the unit material? (C, 2,CT)

The student who 'flamed' in the first place then replied:

> If only you could have gotten on sooner with the info re block 4, all of the agro would have been avoided! All we wanted was proper info, and now we have got it.
>
> Regards, The Exaggerator! (C, 35,S)

Finally, on June 22, another course team member wrote an account of Total Quality Management and the OU, linking the situation of the late mailing with one of the block 4 issues.

> Block 4 is about IT and education. The OU. . . has an outstanding word-wide reputation for the quality of its distance education provision. . .

---

[1]It might be questionned how other discussions of course material could be running concurrently when the material of the block had not even been delivered. In fact, the early threads were all initiated by one student, who happened to visit the OU on another matter, dropped by the course manager's office and picked up a copy of the block, which had long been ready to go out, but was held up by other late items in the mailing.

Much of this reputation is based on the innovative use of IT in the University's teaching. However, in a sense the OU is also a victim of this: use of expensive technologies requires the setting up of specialist centralised service departments who are, at any given moment, working for a large number of different courses. . . When one tries, in addition, to bring into such a tightly organised semi-industrialised production system an entirely new product (DT200), with elements which depend strongly on outside suppliers, hiccups are bound to occur. . . Add to this the fact that the Technology Faculty is officially responsible for the *production* of the course, the Social Science Faculty for its *presentation* and the materials were developed by staff from the Institute of Educational Technology. . .and that all these people work in different places, and are responsible to different people, you have - on any rational model of organisational structures - a recipe for total disaster! Any consultant who could bring anything like Total Quality Management into this structure would be worth her/his weight in gold. . .

If this note sounds apologetic, it wasn't meant to. I was just trying to labour the point that the wide-scale use of IT in an education system such as the OU's makes it very difficult to draw comparisons either with conventional education systems, or with conventional industrial/service operations. The OU shares characteristics of each, and the management of the interface between them is problematic to say the least! (C, 3,CT)

This message is reproduced at such length for two reasons. First of all, it exemplifies the course team's use of CoSy in the first year - responsive, thoughtful, individual, but uncoordinated and rather too late in appearing. Secondly, it relates the issue of introducing such a medium into distance education, to the larger context of this thesis: the quasi-industrialised practices

of distance teaching universities and the effect of the medium in demanding a change to this structure. The description of the management style and structures of the OU enlarges on the theoretical framework of Otto Peters outlined in Chapter One. Certain industrialised management procedures are central and necessary to the operation of such a large organisation, but some of the features and traditions of conventional universities also pertain. Computer conferencing in mass distance education vastly increases the opportunity for on-going, personal interactions between students and staff, thereby increasing the resemblance between distance education and face-to-face education. The kind of openness about OU management and mistakes, the availability of central staff and tutors, and the interactive nature of the discussion, all shown in this Block 4 example, are much more typical of the personal interactions of face-to-face education than of distance education, even with occasional tutorials.

ACCOMPLISHMENTS

There were a number of major accomplishments during the first year presentation of the course for which the course team can largely take credit, despite the oversights documented so far.

Feedback

The course team members responsible for evaluating the use of CoSy took many opportunities to solicit the views of tutors and students about the course, computer conferencing and suggested changes to their presentation. Individual students, who showed either exceptionally good or very poor understanding of CoSy were mailed to request feedback on the teaching strategy of the associated material. Results from this were used in the re-write of the material which was carried out during the first year of presentation to be ready for the second year. One course team member introduced a thread into

the block 4 education topic of Forum requesting student opinion on the value of CMC. Several discussions with tutors were also initiated on DT200-tut, one of them requesting tutor feedback on the proposal to introduce regional level conferences the following year. On the basis of the tutors' response to this message, the local tutor group conferences were not scrapped as had originally been planned. The effect of this expansion of decision-making power is clearly seen in the following selection of extracts from tutors, students and members of the course team:

> As far as I am concerned, being able to reach the Course Team has been the greatest advantage of CoSy so far. (C, 7,T)

> If either tutorial or central staff fancy 'resting on their laurels' they should steer well clear of DT200. Your performance will not be judged upon who you are, what you did once, but rather upon what you are doing now. (Brown, 1988)

> This is the first time in 19 years at the OU that I've felt in direct contact (even if it isn't) with students on a regular basis throughout a course (C, 2,CT)

> Thank you for giving tutors the chance to comment on future plans for DT200. For me, this is the reason why this course will always be rather special. (C, 16,T)

> I would be only too pleased to pass on my experiences of the system so far and Bk 2 pt D in particular. (C, 39,S)

> I feel much more 'in touch' than I do in face-to-face tutor groups. . . Long live the electronic revolution. Distance learning's never been so good! (C, 40,S)

Certainly for some tutors and students, this facility counter balanced the negative effects of the cost and time committment in using CoSy. More

significantly, these extracts suggest a kind of interdependence amongst teachers and learners which benefits all concerned.

Course maintenance

The management of CoSy in the first year may have been faulty, but the efforts of the course team to respond to conference messages, to personalise learning and to improve their maintenance of the course has had positive results. An outside evaluator wrote of the refreshing and beneficial changes brought by the use of computer conferencing to the OU which had become accustomed to doing things in set ways as it reaches respectable maturity. (Castro, 1988:10) The greater accountability of course teams to students and the visibility of inefficiencies and shortcomings has entered the annuls of course maintenance.

> . . .now the genie of continuing public debate and feedback about course delivery is out of the bottle there will be no getting it back in. (Brown, 1988)

Course delivery is now as visible and open to critical debate as the much vaunted OU course units.

Teaching at a distance

The course team approach of investing considerable care and attention into writing distance teaching material has disproved the maxim in conferencing literature (McCreary and Van Duren, 1986) that an introductory face-to-face meeting is vital for getting users up and running. Over 1000 students learned to use the system at a distance, and through feedback and evaluation, improvements in the materials continue to be made.

Capitalising on the Uniqueness of the Medium

Although the course team was often slow to exploit the advantages of electronic communication, the design and conception of the project showed an appreciation of the unique properties of this medium for mass distance education. It provided students with considerable scope to devise their own approach to the assignment through the use of an extensive questionnaire; it built on the large student population to create a database with significant numbers in all fields; and it drew on an understanding of all the course software. A number of students used the project topic and the tutor group conferences to do 'mini-surveys' on specialised subjects to substantiate their point of view. The course team was impressed with the quality of the students' work, and offered prizes for the best six projects.

Enthusiasm for the Medium

The introduction of electronic communication to the University as an educational tool was not originally viewed with much enthusiasm. It was a big headache for the technicians, a big yawn for the technologists and a big pound sign to the administration. Whatever else the DT200 course team has accomplished, it has certainly changed the attitude of many OU staff. Modems are being considered as part of the specifications for the new home computing policy. The new Business School plans to use conferencing on at least two of its courses. Interest in other faculties has developed, enthusiasm for its educational potential has spread, and even financial support for its tutors has been forthcoming.

Institutional Policy

Because of the eagerness of students to stay online after DT200, the Academic Computing Service first granted alumni status to 100 students. As interest in

other sectors grows, for example for disabled and very remote students, and more students from succeeding years of DT200 accumulate, it is now apparent that ACS must consider changing its policy from supporting students on a specific course, to opening its network to all OU students. Similarly, as students have access to tutors and central staff, they expect access to the OU administration for facilities such as: electronic submission of assignments, registration, queries about omissions in the postal material etc. An investigation into the feasibility of these changes has now been made (Dean, 1989). Finally, a paper[1] written collaboratively on CoSy has been submitted to all faculties, the planning office and the regional administration, proposing an Electronic Region be set up in the University, based on the experience and potential shown in the 1988 application of the medium.

CONCLUSIONS

This chapter has shown how lack of resources led to a poor integration of the two uses of computer conferencing on the course - firstly, by minimising the compulsory work on the medium, and secondly, by curtailing tutor involvement. The chapter has also shown the break-down of quasi-industrialised forms of management at the OU in the face of this dynamic, spontaneous medium, which does not respect traditional hierarchies.

In terms of the OU, the most enduring contribution of the course team has been its alteration in the way that the course is maintained, and, just as crucial, is *seen* to be maintained. New applications may be forthcoming at third and fourth level, which more radically alter the way in which OU courses are produced (Thomas, 1989 and Rumble, 1989b) - small, upper level courses taught mainly online by central staff and a few tutors, using a set book rather

---

[1]The paper is called "The role of computer-mediated communication in Open University teaching", prepared by Tony Kaye from the contributions of over 75 participants.

than tailor-made units. DT200 has given a taste of a wide variety of possibilities - team teaching, course team members teaching, updating and providing peripheral material, online project work, counselling, survey research and simple administration. As pioneers, the course team suffered many of the problems of any innovatory programme, but it also benefitted from the pioneering spirit of its participants.

> In introducing a technology such as CMC, the creation of new forms of learning is likely to be in conflict with the desire for tradition and continuity. This can - quite reasonably - give rise to the fear that technology itself might dictate the nature of future syllabi and educational structures. Whilst this real danger must be recognised, it is important to ensure that the desire for continuity does not prevent the emergence of new, innovative learning and teaching techniques that the medium makes possible. (Kaye, 1989: 20)

The application of computer conferencing which the course team devised was possibly over-cautious; it certainly did not nearly exploit the power of the medium, but it did alter the habitual working of the University in small but significant ways.

CHAPTER EIGHT: CONCLUSIONS

SUMMARY OF FINDINGS

The three theoretical frameworks introduced in the first chapter were developed as fundamental perspectives from which to analyse the use of computer conferencing on DT200. Each of the three, independence and autonomy, interaction and communication, and quasi-industrialisation, will now be reviewed in the light of the findings of this case study. The prediction of a convergence between distance and mainstream education will then be supported by drawing together the various threads of evidence given throughout the thesis.

Independence and Autonomy

Chapter Five showed how the addition of computer conferencing to the OU's distance education facilities supported students' independence and autonomy: it allowed students to receive counselling and tuition, to find out the views and attitudes of their fellows, and to share in a more spontaneous, less packaged, learning environment. Furthermore, it allowed students to partake of these opportunities to the extent that they chose. It can be said, therefore, to *actively* support student independence by providing access to resources. Using quotations from students who participated regularly in the conferences, the chapter also showed how conferencing encouraged a personal engagement in learning. However, the chapter highlights the amount of disappointment expressed by students and tutors in the 1988 application and indicates that to some extent this medium gave an illusion of control to the user, which its limitations and immature development could not fulfill. There was no evidence on this application of changes in students' level of self-directedness.

Garrison (1989) suggests that 'interdependence' would be a better term than 'independence' to capture the true requirements of distance learners, and explains this as follows:

> In distance education control of the educational transaction must not be seen only from the student's perspective but as something shared between both student and teacher. Students do not have control of a learning experience if they are arbitrarily given independence but do not possess the skills and ability to take advantage of the situation. Such an illusion of control can be very discouraging for the learner and masks the true nature of the educational transaction. Control is manifested through interaction among teacher, student and content demands. (p. 40)

Computer conferencing on DT200, therefore, increased the interdependence of students, tutors and the course team to their mutual benefit. Chapter Seven provided evidence of this in relation to feedback, maintenance of the course and support during initial learning difficulties. Several factors limited the full realisation of this benefit: the uneven take-up of the medium and various limitations in the medium itself, discussed in Chapter Five, and the tentative nature of the application, shown in Chapter Six. Nevertheless, the evidence of all three data chapters shows that for some students it strengthened contact with the course and provided the kind of community which distance education normally lacks. In this sense, then, the introduction of computer conferencing to mass distance education can be seen as an evolutionary step in the development of distance education from correspondence study towards a fully interactive, responsive educational process for distance learners, and by supporting the trend towards greater interdependence, it is a tool which will be valued by educators in many kinds of institutions.

Interaction and Communication

The emphasis on personalised learning through interaction and communication is a feature of the education literature whether at a distance or on campus. The limited opportunity for interactive learning in distance education has fuelled the expectations that computer conferencing will fill this communication gap. This thesis has tried to give a comprehensive and realistic assessment of the extent to which it lived up to these expectations on one particular application. Chapter Five detailed how communication on the level of information exchange - technical help, advice about assignments, administrative matters of the tutorial group, and announcements from the course team - was a positive feature of the DT200 use. Communication at a social and emotional level was also in evidence, though for fewer students. The content analysis section of Chapter Five looked at evidence of interactive discussion and concluded that sustained interaction about the issues raised by the course material was even less common, though the possibility of it seemed 'just around the corner'. However, the unprecedented interactions between students and the course team, and the immediate feedback about the course from tutors and students, discussed in Chapter Seven, were among the most positive outcomes of the application. This chapter also showed that the direct contact of some course team members with students' opinions and experiences led to greater understanding and ultimately to a course more in tune with students' needs. All three chapters give indications of how the use of computer conferencing in the OU leads to the greater empowerment of tutors, both in enhancing their role as teachers and as participants in course presentation and maintenance, and in increasing their hours and financial recompense due to the labour-intensive nature of the medium.

Computer conferencing, among other recent telecommunication technologies, supports group learning at a distance. This possibility must now be reflected in the definition of distance education:

> Not all forms of distance learning imply individual or private activity and, therefore, the definition of distance education must be able to accommodate the possibility of educational transactions involving groups of students. (Garrison, 1989: 6)

However, this application of the medium shows that these benefits are not shared by all students. Chapter Six concluded that the medium disadvantaged certain students, and that, as with face-to-face tutorials, many students chose not to take part. More significantly, it confirmed other research indicating that the level of interaction in a conference is highly dependent on the activity of the tutor. It also reported a gap between tutors expectations of the medium and the actuality of using it.

Quasi-industrialisation

The elements of OU course production and maintenance which resemble industrial practices were referred to at various points throughout the study: their advantages in providing high quality, mass education, their necessity in the complex coordination of creation, production and delivery of materials, and the ways in which the use of computer conferencing mitigates their worst features. Evidence was presented in all three data chapters of how the spontaneity, subjectivity and personalising of conferencing content helped to bring to life and unpackage the polished, impersonal quality of course units. Chapter Seven gave an example of how CoSy was used to correct outdated material 'caste in concrete' in the printed texts, which were written as much as a year before the course was presented and had to last the full six years of the course's life.

Chapter Seven highlighted the way in which the promotion of computer conferencing by the course team against all the odds of cost, bureaucracy and technical difficulties reflects the OU's long-standing interest in support of students and the search for methods of providing a rich learning environment. Computer conferencing was seen as a means of resisting the assembly-line implications of the industrial model, and at the same time, of individualising and vivifying distance education. Quasi-industrialised elements, however, continue to be needed in using a conferencing system in mass distance education: considerable planning and development work, division of labour in responding to students, and specialisation into areas of expertise. Changes to the way in which the maintenance of a course is routinely carried out in the OU will be a dominant feature of the use of computer conferencing. Course teams will have to take account of student feedback and tutor input; they will have to respond more quickly to student needs and they will have to use the powerful facilities of a communications facility to maintain the course.

> A recognition of the role that communictions technology can play in education in managing the information explosion will eventually transform the structure of the educational transaction. This recognition will create a shift from traditional modes of teaching to a more balanced and collaborative transaction where the learner will assume an appropriate share of control of the educational process. Communications technology is breaking down the existing bureaucratic structure where the teacher is the primary source of information and control. (Garrison, 1989: 41)

In this extract, Garrison suggests that the non-industrialised ethos of traditional educational systems will also be changed by communications technologies. He indicates that the direction in which the educational processes are being pulled by these media, is towards a collaborative,

interdependent transaction between teachers and taught. Neither the quasi-industrialism of large distance teaching institutions, nor the artesan model of traditional education, where the teacher is the 'master craftsman' in the classroom, will survive the information explosion.

The Convergence Hypothesis

The extent to which the three theories have been useful in this analysis is perhaps a reflection of the extent to which distance and mainstream education are still distinct entities. Nevertheless, the notion of convergence postulates a trend or an increasing merger of the two. This case study has highlighted a number of ways in which computer conferencing has made one OU course resemble a campus-based course. Chapter Six noted the sense of an educational community felt by a number of students; Chapter Seven documented the increased access to others on the course mentioned by course team members and tutors as well as students; and Chapter Five reported a number of ways in which users too felt less 'distanced' on this course. All three chapters gave evidence of the labour intensive requirements of the medium, the enhancement of the tutorial function and the concommitant costs involved in supporting this medium, which are the fundamental factors in the resemblance of the DT200 application to a campus-based course.

Speculating about whether the OU could move towards the development of courses based on set books and articles supported by central academics moderating computer conferences, Rumble (1989b) comments:

> If so, this could lead to a massive change in the way resources are used by distance teaching institutions such as the British Open University. In effect, there would be a move away from the capital intensive (and costly) development of mass-produced instructional materials, which would be replaced by bought-in materials (books, offprints, etc.) acquired

at a much lower cost. The savings generated could be used to teach and counsel students through CMC systems. The role of academics in distance teaching institutions, which, because of their role as writers, has been largely divorced from that of academics in conventional universities, would change again, becoming closer to the traditional role of academics in conventional universities, but with a subtle and important difference: they would be conference moderators and personal advisors, not lecturers and seminar leaders. (p 248)

Many other universities are using computer conferencing with both campus-based and distance education students, and acknowledge a blurring of the usual distinction between the two (Black *et al.*, 1988; Paulson and Rekkedal, 1988). Of course the goals of both kinds of education are the same, and educators at both traditional and distance education institutions are looking for ways of engaging students in active learning.

> Using self-directed education as the educational standard, distance is a cluster of qualities which may occur in various combinations as a normal component of *any* educational event - whether contiguous, self-directed, or at a distance. Educational distance *per se* is an educationally *neutral* quality, which may be educationally either desirable or undesirable, depending on the circumstances of each given event. (Bagnall, 1988: 94)

From this point of view, computer conferencing is a useful tool for any educator to overcome distance, as and when needed.

The widespread use of microcomputers at traditional campuses is already challenging the supremacy of the face-to-face interaction (Guri-Rozenblit, 1988). The multi-media approach to teaching and learning, the hallmark of the Open University and of this application, is beginning to find adherents in campus based education.

> Since the total structure of the Distance Teaching Universities' learning system is much more open than that of a traditional university, it is possible to generate a variety of models for multi-media course development, which might penetrate gradually into conventional campuses. . . In this sense, the learning systems of DTU might be the pioneers in the academic world. (Guri-Rozenblit, 1988: 237)

One of the elements in the growing convergence is a greater reliance on course presentation and delivery through several media. Computer conferencing is ideally suited to combine with print and face-to-face teaching.

If the evidence of convergence presented here is sound, the question is: are the two simply imitating each other, or are they both moving towards something new? A number of factors point to the latter:

- the lack of traditional hierarchy in conference messages, such that tutors were not regarded as possessors of all the right answers, and students were often the accepted experts
- the demands of a conferencing environment for personal, responsive and interactive management procedures
- the unique environment conferencing creates, incorporating the interactive advantages of the traditional classroom with the distinct advantages of asynchronous and flexibile access
- the ability of course creators to design and modify courses as well as to teach and collaborate with students both individually and on a large scale.

Roberts also concludes that conferencing could potentially lead to something structurely different from either place-based or distance education:

> The electronic seminar has the potential to alter dramatically our structural notions about higher education by allowing the dialogue of

learning to occur in an environment populated by independent and distance learners (Roberts, 1988: 37)

The new notion about higher education is not an amalgam of distance and traditional education features; but a convergence towards a new educational environment.

RESEARCH QUESTIONS

The research questions posed in Chapter Three must now be answered in the light of the findings of this research. Defining the success of this application was seen as the crucial question from which to begin the analysis. The criteria suggested for defining the success in this area were: the perspectives of the participants (students, tutors and course team), the nature, purpose and duration of the task, and the way in which the conferencing medium is structured, organised and designed. Evidence was presented in Chapter Six of how the ambiguous nature of the task affected the participation of both tutors and students. The lay-out of national and local conferences proved to be inappropriate both for tutors to provide a substitute for face-to-face tutorials, and for the critical mass of student users. Limitations in the structure of the medium, listed in Chapter Five, impeded the full accomplishment of the task, and affected the attitudes of all the participants. The duration of the task gave an opportunity for changes of attitude, style of working and patterns of usage. The lack of organisation of CoSy, described in Chapter Seven, certainly contributed to the frustrations of students and tutors, and to a change in course team perceptions. Using this kind of triangulation, the elements of the OU application can be seen in various relations, and similarities and differences in other applications, proposed or actual, can be identified and their effects compared.

Question 1

The first question to be answered, using these three criteria and the research findings is: Can large numbers of participants use conferencing effectively? The findings in Chapter Five show that very large numbers mastered the skills of logging on and replying to mail, that many used conferencing for browsing and lurking, and that a minority participated interactively. It was noted that the medium itself withstood the impact of large scale usage, and that the basic task of teaching large numbers of students to use the system at a distance was also accomplished. The lack of interactive use of the conferences by the majority of students, however, is a strong indication that this mass application of the medium was not entirely effective. Of course, a 100% use and acceptance of the medium was never an aim in introducing conferencing, and with large numbers of people, especially adults, there will always be a wide spread of use for any learning medium. The third of students who used conferencing interactively is, by conferencing standards, still a large number. The third of students who read without contributing did not necessarily consider their use ineffective. Changes in the 'architecture' of the DT200 conferences (by adding regional conferences), and in the nature of the task, as well as developments in the structure of the medium could well encourage more non-users to become effective users.

Question 2

The second question was: Is computer conferencing an effective tutoring medium? The complexities of the role of the OU tutor were shown in Chapter Six to have some relevance in answering this question. As supporters of students in difficulty and as facilitators of a social environment for learning, the tutors on this course found the medium effective, though not for all students. Due to the nature of the task and the design of the conferences,

tutors were unable to use the medium for interactive discussion of course material and exploration of course issues. As with the educational use of television, computer conferencing is useful for broadening and enlivening the learning environment, but it is less successful at focussed, in-depth analysis and delivery of core material for mastery.

> It is the nature of the communication process that will determine the effectiveness of the learning process. Effectiveness is dependent upon supporting the educational transaction appropriately and is intimately related to the communication process. Support through communication provides richness and variety during the educational transaction which motivates and sustains students. The strength of teleconferencing is that it goes beyond extending access to education at a distance by providing effective support of the educational transaction. (Garrison, 1989: 64)

As part of a multi-media approach to distance education, computer conferencing in this application found its unique niche - for communication amongst a wider community, for increased feedback, for support and guidance, and for social contact. The evidence suggests that it would not be effective as a total substitute for all other tutoring media - face-to-face meetings, telephone calls and written comments on assignments. However, as a new and unique medium, it also extends the tutoring role in ways unprecedented in the OU system. The 1988 application showed that the medium gave scope to tutors to discover individual styles and try new possibilities, and to express their personal interpretations of the tutoring role. Their participation in the development of the course, and the improvements to the design of conferences heralds a new direction in the role of the OU tutor. The opportunity for team teaching, for innovative kinds of assignment preparation and capitalising on tutor expertise are new features of tutoring which this application began to explore. The conclusions of Chapter Six showed both that

computer conferencing was an effective medium for many aspects of tutoring and that it was also a harbinger of how tutoring itself could be more effective.

Question 3

The last of the research questions was: Does computer conferencing work as a minor component of a multi-media course? This question can be answered quite simply - no. The evidence suggests that electronic mail alone might work well as a support medium for mass distance education. However, the expectations aroused by the possibilities of group communication, and the power of computer conferencing to radically alter and extend communication patterns led to frustration and disappointment in OU users, when this medium was confined to a minor or optional role.

Chapter Seven concluded that the major inhibiting factor in this application was cost - both for the institution and for the users. In this respect Laaser (1988) strikes an ominous note when analysing the obstacles to implementing new information technologies in distance education:

> It is clear that introduction of new information technologies is controlled by clearly expressed costs considerations. . . One may therefore expect that telecommunications-based technologies be implemented in the teaching, tutoring and monitoring environment only if they provide cost-effective solutions in comparison to traditional technologies. (p. 290)

The evidence from this study shows that this application of computer conferencing is neither a substitute for traditional technologies, nor a cost-effective benefit to the structure of distance education. In fact, on DT200, computer conferencing was labour intensive, inefficient in the use of teaching and learning time, and often unreliable technically and limiting in its inherent structure. Nevertheless, where CoSy was working well, participants found it

exciting, thought-provoking, beguiling in its potential, and good fun. Whether the 'value-added' elements of computer conferencing are seen to outweigh the disadvantages and to warrant the additional costs, will be borne out with time.

The nature of this small-scale, largely optional use can not be recommended as a blueprint for other distance education institutions. However, from the examples given in each of the data chapters of conferencing working as an interactive, supportive and enlivening component of the course, conferencing can be recommended as a valuable addition to multi-media courses.

CONTRIBUTION OF THIS CASE STUDY

This study continues the tradition of detailed, in-depth analysis of conferencing applications begun by the Institute of the Future and continued by Hiltz in *Online Communities* and the *Virtual Classroom.* A number of their findings have been confirmed: that pre-use experience is not a determining factor in the take-up of the medium, that pre-use attitudes are important, and that user reactions to the medium are similar despite different conferencing systems and tasks. In Chapter Three, this study has drawn together the work of many researchers in the field and categorised them by type of research, by type of host institution, and by scale of application. It has shown how the OU application is unique in using computer conferencing for mass distance education. By presenting a detailed analysis of this complex and large-scale application, the present study both builds on the literature and extends it into new areas.

Expanding the Knowledge Base

There are a number of ways in which this study has contributed to the basic knowledge of the field:

- the analysis has extended beyond the reactions of students to include those of the tutors and the course team

- the reasons for use and non-use have been researched and explored in considerable depth, so that a fair analysis can be made of the medium's advantages and disadvantages

- a comprehensive presentation has been made of the quantitative data, so that comparisons can be made with future applications

- the limitations of the medium have been identified in such a way that systems designers can see the requirements for future development.

Unique Contributions

There are a number of ways in which this study has made new contributions to the literature in the field:

- the study has developed a holistic approach to the analysis of computer conferencing, which depends on a careful blending of quantitative and qualitative analysis

- it has taken a lead in establishing the qualitative analysis of conference content

- it is the first comprehensive study of a large scale educational application of the medium

- this case study of a tutorial application of computer conferencing has established this type of use as a distinct category.

FURTHER STUDY

As an early study in a new and expanding field, this thesis has been exploratory and wide ranging in its outlook, responding to unexpected outcomes as they occurred and aiming to define phenomena which warrant further research. Particular questions raised from this study which could usefully be compared with future applications are listed below:

- Is the split of one third interactive users, one third lurkers and one third non-users typical of any large group of students?
- What is the critical mass of students required to run effective *tutorial* conferences?
- What is the quality and pattern of usage when high costs and marginal status are not major inhibiting factors?

Of course further studies of this medium both in large-scale applications and in tutorial mode are needed. Only by other results will the findings of this study be set in context, so that what is OU-specific can be clearly distinguished from what is generalisable.

RECOMMENDATIONS

Despite the fact that this case study is breaking new ground in so many ways, a few recommendations can be made from the findings:

- the OU should continue to explore the use of computer conferencing as a mass distance education medium
- comparisons with subsequent years of DT200 should be made to find the effects of various alterations to the structure and nature of the task, and to document changes over time

- the use of this medium for tutoring should be considered by other institutions

- conferencing software should be developed to overcome the present limitations, particularly the unappealing nature of working offline.

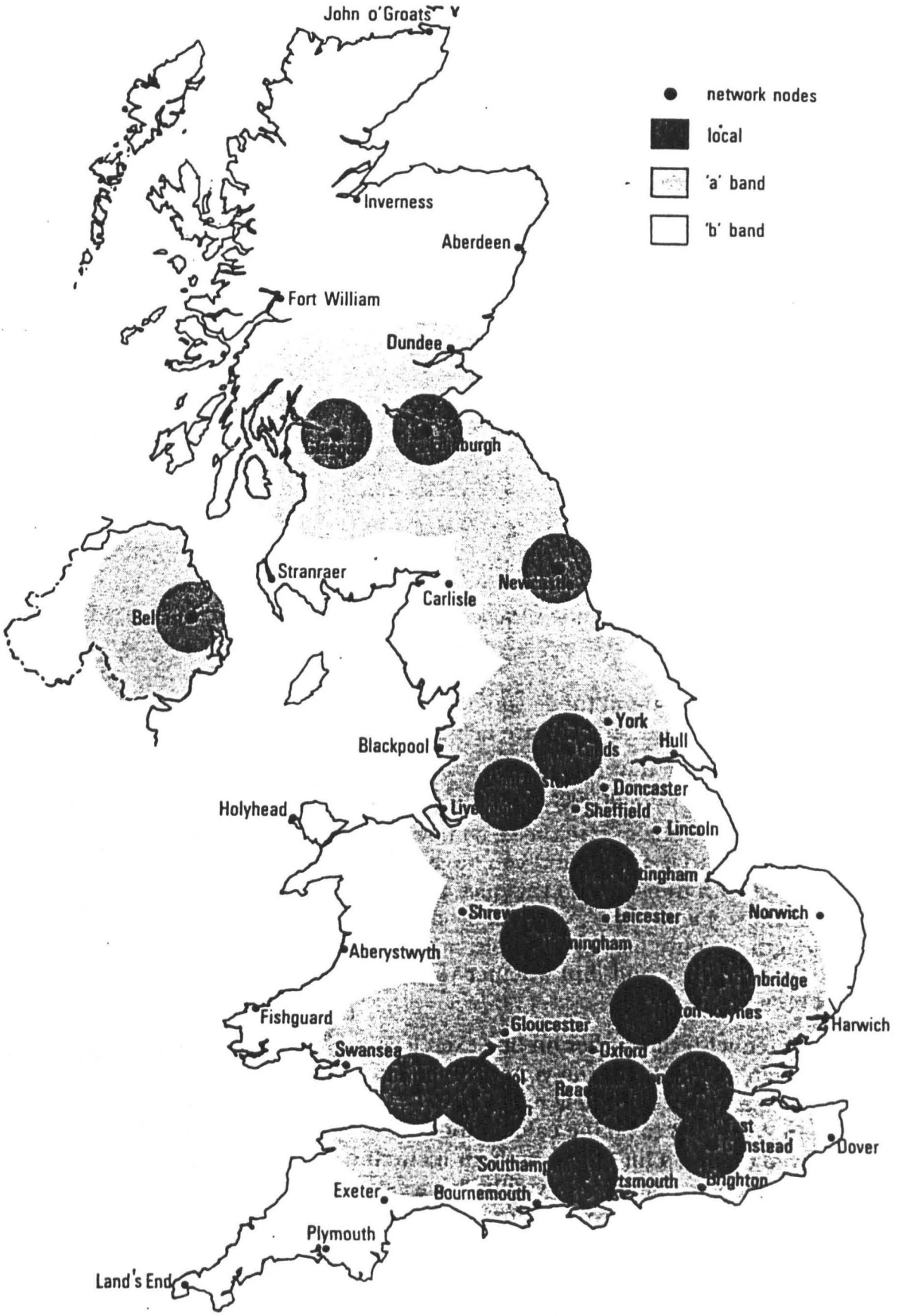
SUMMARY OF THE MEDIUM

This study has shown that computer conferencing can be used for information exchange, for practical help, for overcoming isolation and creating a communal learning environment. The higher level aspects of tutoring - teaching, facilitating interactive discussion, pursuing course issues in depth - are much more difficult to achieve with this medium. These require more support, both financially and practically, and more committment to making computer conferencing a major medium of mass distance education.

Because of the evident power of the medium, it should not be used tentatively. Because of the present limitations of the medium, it should be used realistically. Communication and interaction are in vogue in education, and the considerable interest in computer conferencing reflects its position as the right medium at the right time. It enhances the autonomy and independence of learners and breaks down hierarchical forms of teaching and management. With perceptive explorations, computer conferencing will establish its rightful place in teaching and learning.

APPENDIX ONE

THE OPEN UNIVERSITY NETWORK, 1988



APPENDIX TWO

PROJECT QUESTIONNAIRE: PART 1 : FEEDBACK

Education:

1 Are you in your 1st, 2nd, 3rd etc. year of OU study?

1st	2	**6th**	131
2nd	162	**7th**	50
3rd	160	**8th**	37
4th	148	**9th**	11
5th	139	**10th or greater**	32

Total: 872

2 Which, if any, foundation course(s) have you passed? (Enter as many codes as apply)

A	Arts	122	S	Science	184
D	Social Sciences	271	T	Technology	543
M	Mathematics	185	N	None	2

Total: 1305

3 Apart from any OU credits you might have, do you have any other educational qualifications?

A	No formal qualifications	53
B	Some qualifications (e.g. CSE, O levels, A levels, OND, etc)	491
C	Higher qualifications (e.g. HND, HNC, teaching certificate, degree etc.)	329

Total: 873

Geographical

4 Which OU region do you live in? (01 to 13)? If other (e.g. abroad), enter 14.

01	105	**06**	97	**11**	94
02	111	**07**	49	**12**	18
03	66	**08**	87	**13**	66
04	65	**09**	39		
05	97	**10**	41		

Total: 903

5 What kind of environment do you live in?

A	A central location of a city or large town (more than 100,000 inhabitants)	106
B	A suburb of a city or large town	229
C	A medium sized town (10,000 to 100,000)	246
D	A small town or village (less than 10,000)	242
E	An isolated dwelling or hamlet	43
F	Other	7

Total: 873

Your workstation

Position:

6 Which of the following best describes the way your workstation is set up?

A	I cannot leave my workstation permanently set up.	36
B	My workstation is permanently set up, but I cannot use it at all times.	147
C	My workstation is permanently set up, and is always available.	682
D	None of the above apply.	8

Total: 873

7 Is the phone socket you use for your workstation:

A	conveniently placed?	429
B	satisfactorily placed?	315
C	awkwardly placed?	129

Total: 873

Your computer:

8 Which machine are you using for the course?

A	Apricot	3	D	IBM	32
B	Amstrad	766	E	Zenith	16
C	Akhter	8	F	other	48

Total: 873

9 How much internal memory does it have?

A	less than 512K	11
B	512K	662
C	greater than 512K	200

Total: 873

10 What type of disk drive does it have?

A	single floppy only	10
B	twin floppy	639
C	hard disk and floppy	157
D	other	10

Total: 873

11 If you are using your DT200 workstation at home, how long have you had the machine set up and running?

A	less than one week	36
B	between one week and one month	241
C	between one month and six months	443
D	more than six months	101
E	not used at home	52

Total: 873

12 How was your micro workstation acquired?

A	bought outright	294
B	buying with personal loan/HP/other credit	103
C	leasing/renting: OU	350
D	leasing/renting: other	4
E	acquired via employment	79
F	acquired in some other way	7
G	not yet acquired	0
H	not acquired personally (access by some other means)	33
I	other	3

Total: 873

13 Who is responsible for funding the acquisition of your workstation (enter codes for as many as apply)?

A	yourself	568
B	OU grant	20
C	other grant	2
D	employer	141
E	other	28

Total: 759

14 Did the cost of acquiring and using the workstation affect your decision to take the course?

A	It was a significant deterrent	55
B	It deterred me a little	305
C	It did not deter me at all	513

Total: 868

15 Who apart from yourself was involved in the decision about the particular machine you acquired (enter as many codes as apply?

A	no one	441
B	your spouse/partner	190
C	your children	3
D	other members of your household	6
E	your employer	58
F	your colleagues	22
G	other(s)	56

Total: 776

Previous experience:

16 Please indicate the levels of your previous experience with the following (enter at least one code from each section):

With a keyboard

A	never used keyboard	33
B	searching for keys	191
C	familiar with keyboard	526
D	touch typist	131

Total: 881

With electronic mail

E	no experience	565
F	a little	185
G	some competence	97
H	expert	21

Total: 868

With microcomputers (enter as many as apply)

I	no experience	150
J	games player	254
K	business package user	330
L	programmer	196
M	technician, repairs	85
N	sales and administration	53
O	educational use	234
P	word processing	445
Q	other	163

Total: 1910

17 Did your experience, prior to this course, come through (enter as many codes as apply):

A	hobby (self taught)?	163

B	informal training?	127
C	formal training?	85
D	not applicable?	144

Total: 519

18 If through formal training, indicate the length of the training period(s) (enter as many codes as apply):

A	short training course (one week or less)	220
B	extended training course (between one week and one month)	102
C	long training course	110
D	no formal training received	515

Total: 947

19 Did you use the typing tutor supplied on disk by the OU?

A	a lot	27
B	a little	421
C	not at all	393
D	what typing tutor?	32

Total: 873

Attitude to use:

20 I expect it to be: 1 hard to learn... 7 easy to learn

1	34	5	246
2	47	6	106
3	172	7	92
4	176		

Total:873

21 I expect it to be: 1 impersonal... 7 friendly

1	84	5	151
2	105	6	73
3	211	7	53
4	196		

Total:873

22 I expect it to be: 1 a waste of time... 7 a productive use of time

1	3	5	194
2	16	6	189
3	49	7	281
4	141		

Total:873

23 How do you feel about using computer-mediated communications to increase the amount of communication you have with other students on the course?

A	negative	48
B	indifferent	308
C	positive	517

Total: 873

24 How did you feel about using the electronic communications facility on the course before starting any of the practical work? (Enter as many codes as apply):

A	rather excited about it	327
B	quite interested in it	450
C	fairly neutral about it	116
D	lacking confidence about taking part	158
E	nervous about it	155

Total:1206

Personal information:

25 What is your sex? (F or M)

M	640
F	233

Total:873

26 What is your age? (years)

A	20 or under	0	**G**	46-50	66
B	21-25	25	**H**	51-55	44
C	26-30	98	**I**	56-60	23
D	31-35	213	**J**	61-65	13
E	36-40	240	**K**	66 +	10
F	41-45	141			

Total:873

Household:

27 Does your household include (enter as many codes apply):

A	no other adults	94
B	your spouse or partner	720
C	other adults (relatives, friends, etc.)?	139

Total: 953

28 How many children (under 18 years old) live in your household?

A	none	397	**E**	4	12
B	1	162	**F**	5	1
C	2	251	**G**	6 or more	0
D	3	50			

Total: 855

Employment:

29 Are you currently:

A	in paid employment full time?	735
B	in paid employment part time?	58
C	not in paid employment, but seeking work?	24
D	not in paid employment, not seeking work?	56

Total: 873

30 What is your occupation?

A	housewife	30	**I**	technical	114
B	armed forces	20	**J**	skilled trades	22
C	admin and manag.	202	**K**	other manual work	10
D	education	132	**L**	comm./ transport	33
E	medical prof.	12	**M**	clerical and office	63
F	social services	9	**N**	sales and service	29
G	science and eng.	80	**O**	retired	22
H	the arts	46	**P**	in an institution	0
			Q	none of these	49

Total: 873

PROJECT QUESTIONNAIRE : PART 2 : FEEDBACK

Use of other systems

31 Have you used any forms of computer-mediated communication other than CoSy (i.e. Telecom Gold, other electronic mail systems, computer bulletin boards)?

A	never	522	B	yes, occasionally	240
C	yes, regularly	111			

Total: 873

Use of the system

32 How often have you used CoSy to contact (enter one code for each row)

	never		occasionally		often		Total
Your tutor?	A	172	B658	C	56		**886**
Your tutor group	D	267	E524	F	72		**863**
Other tutors or OU staff?	G	620	H170	I	20		**810**
Other OU students?	J	36	K55	L	26		**117**

33 Which of the following conferences have you used? (Enter one code for each row.)

	never		occasionally		often		Total
Your tutor group conference	A	79	B465	C	333		**877**
DT200-news	D	113	E562	F	183		**858**
DT200-lounge	G	333	H446	I	70		**849**
DT200-more-cosy	J	394	K407	L	45		**846**
Other DT200 conferences	M	240	N511	O	102		**853**
Other conferences	P	519	Q276	R	39		**834**

34 How often have you used CoSy's 'conversation facility?

A	Never heard of it	106
B	Have heard of it, but not used it	609
C	Use it occasionally	135
D	Use it regularly	23

Total: 873

35 How many times have you successfully logged on?

A	Never	2
B	1-5	50
C	6-10	100
D	11-20	267
E	21-50	359
F	more than 50	95

Total: 873

36 What was your overall success rate in connecting to the mail/conferencing system (i.e. all steps work, through to CoSy)?

A	Almost always successful (90% or over of attempts succeed)	560
B	Mostly successful (50% and over)	277
C	Mostly unsuccessful (less than 50%)	36

Total: 873

37 Have you had problems in any of the following steps in connecting to CoSy? (Enter one code for each row.)

	Never		Occasionally		Frequently		Total
Modem set up and dialling	**A**	576	**B**	261	**C**	30	**867**
Dialled but no answer	**D**	400	**E**	432	**F**	26	**858**
Answered, but no 'connect'	**G**	191	**H**	608	**I**	71	**870**
Stuck at 'select service' or username'	**J**	558	**K**	267	**L**	30	**855**
Stuck at 'DT200"	**M**	649	**N**	186	**O**	17	**852**
'no carrier' after connected to CoSy	**P**	343	**Q**	460	**R**	46	**849**

38 When you connect to CoSy, which telephone charge band applies?

A	local	475
B	a band	219
C	b band	123
D	bl band	33
E	c band	23

Total: 873

39 Have you had any serious technical difficulties in using your work station? (Enter as many codes as apply.)

A	Yes, due to problems with computer or peripherals	81
B	Yes, due to problems with the telephone system and network	26
C	Yes, due to problems with the ACS computer	26
D	Yes, other reasons	67
E	No	516

Total: 716

40 Have you had any non-technical difficulties in using your work station? (Enter as many codes as apply.)

A	No	388
B	Yes, due mainly to own nervousness/psychological resistance	150
C	Yes, due mainly to competition to use the work station from other members of household	42
D	Yes, due to difficulty in finding a quiet/convenient	

	place to use it	49
E	Yes, due to problems in following the instructions	320
F	For other reasons	192

Total: 1141

41 When you use the mail/conferencing system, how often do you prepare material off-line for subsequent transmission?

A	Always on-line, never off-line	123
B	More than half prepared on-line	159
C	Less than half prepared on-line	292
D	Never on line, always off-line	299

Total: 873

42 When you visit CoSy to check your mail, which do you do most frequently:

A	Read any messages on-line and reply on-line?	203
B	Read any messages on-line and reply off-line?	182
C	Download any messages and read them off-line?	253
D	Download any messages, print out a hard copy and then read them?	208
E	None of these	27

Total: 873

43 When you visit CoSy to check your conferences, which do you do most frequently:

A	Read new entries on-line and reply on-line?	112
B	Read new entries on-line and reply off-line?	122
C	Download new entries and read them off-line?	317
D	Download new entries, print out a hard copy and then read them?	247
E	None of these	75

Total: 873

44 How often do you use your printer to make hard copies of mail or conferencing entries?

A	Never	68
B	Occasionally	410
C	Frequently	395

Total: 873

45 If you do use your printer with CoSy, what do you print? (Enter as many codes as apply.)

A	Your tutor conference	614
B	Items from the course team	546
C	Other conferences	369

D	Personal mail	653
E	Other	206

Total: 2391

46 If you had difficulties with the computer-mediated communication part of the course that you could not resolve on your own, did you turn to any of the following for help (enter as many codes as apply.): ***(Help who)***

and

47 If you used any of the above sources of help which was the most helpful? ***(Most help)***

		help who	most help
A	Tutor?	230	84
B	Fellow student?	262	160
C	Spouse or partner?	103	55
D	Your children?	27	14
E	Non-course friend?	50	10
F	ACS telephone help service?	225	121
G	Colleague at work?	86	35
H	On-line help messages ?	376	179
I	Other people?	33	14
J	None of these	194	201

Total: help who 1586
most help 873

Attitude to CMC

48 Has your attitude to CMC changed since completing the first questionnaire? (Enter one code from each line.) Are you:

A	More excited	104	F	Less interested?	149
B	As excited	350	G	More anxious?	77
C	Less excited?	315	H	As anxious	137
D	More interested?	220	I	Less anxious	516
E	As interested?	454			

Total: 2322

49 Do you feel comfortable yet about (enter one code from each row):

Logging on	A	yes	843	B	no	28
Sending mail	C	yes	691	D	no	175
Participating in a conference	E	yes	396	F	no	479

Total: 2612

50 If yes, about how many times did you have to use the system before gaining this confidence? (Enter at most one code from each line.)

	1-5	6-10	11-20	21+
Logging on	A 678	B 157	C 23	D 14
Sending mail	E 527	F 165	G 25	H 25
Adding to conference	I 329	J 123	K 64	L 56

Total: 2186

51 How helpful did you find the menu-based interface on OUCOM in first learning to use CoSy? (Enter one code for each part of the question.)

A	Very helpful	535
B	Quite helpful	284
C	Not helpful	51

Do you still use it?

E	No	50
F	Occasionally	272
G	Frequently	498

Total: 1690

52 Please comment on your reactions to the menu-based interface OUCOM provides for CoSy. You may enter up to 255 characters (about 30 words).

Comparisons

53 How would you compare conferencing with face-to-face tutorials

As a means of getting help with your course-related difficulties?

A	Better	95
B	As good	156
C	Less effective	527
D	Don't know	95

Total: 873

As a means of socializing

E	Better	56
F	As good	101
G	Less effective	611
H	Don't know	79

Total: 847

As a medium for intellectual exchange?

I	Better	125

J As good 242
K Less effective 397
L Don't know 91

Total: 855

In terms of cost to you conferencing is:

M more expensive 513
N About the same 199
O Less expensive 136

Total: 848

In terms of time spent by you, conferencing is:

P more time consuming 458
Q About the same 163
R Less time consuming 222

Total: 843

54 How would you compare conferencing with telephoning your tutor

As a means of getting help with your course-related difficulties:

A Better 148 B As good 191 C Less effective 419 D Don't know 110

Total: 868

As a source of moral support:

E Better 93 F As good 212 G Less effective 441 H Don't know 107

Total: 853

55 Does your own experience generally support or contradict the following suggestions about computer-mediated communication? (Enter one code from each row.)

	A=Agree	B=Disagree	C=Uncertain
1	**Individuals can participate more equally in electronic than in face-to-face communication.**	A 497 B 213	C 162
	Total: 872		
2	**Computer communication is depersonalizing**	A 451 B 242	C 174
	Total: 867		
3	**Computer conferencing encourages individual assertiveness**	A 373 B 207	C 289

Total: 869

4	**Personal interaction is more difficult with computer communication because of the lack of contextual and verbal feedback**	**A** 600	**B** 134	**C** 126

Total: 860

REFERENCES

Alexander, G. and C. Lincoln. (1989). The Thoughtbox: A Computer-based Communication System for Distance Learning. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Alexander, G., A.R. Kaye and R. Mason (1988). Block 2 Part D of DT200 Introduction to Information Technology: Social and Technological Issues, The Open University, Milton Keynes.

Andrews, J. and J. Strain (1985). Computer-assisted distance education: off-line and on-line American experiences. *Distance Education*, **6**(2), pp 143-157.

Arnold, S.D. (1988). Distance Education: An Affront to Traditional Higher Education? *ICDE Bulletin*, **18**(September), pp 48-55.

Baath, J. (1980). *Postal two-way communication in correspondence education.* Gleerup, Lund.

Bacsich, P., A. Kaye and P. Lefrere (1986). *Oxford Surveys in Information Technology*, **3**. Oxford University Press, Oxford.

Bagnall, R.G. (1988). Reconceptualising and revaluing distance education through the perspective of self-direction. In: *Developing Distance Education* (D. Sewart and J.S. Daniel, eds.). International Council for Distance Education, 14th World Conference, Oslo, 9-16 August, 1988.

Baird, P. and B. Forer (1987). An Experiment in Computer Conferencing Using a Local Area Network. *Electronic Library*, **5**(3), pp 162-69.

Baron, N. (1984). Computer Mediated Communication as a Force in Language Change. *Visible Language*, **XVIII**(2), pp 118-141.

Bates, A. (1980). The Planning and Management of Audio-Visual Media in Distance Learning Institutions. UNESCO. International Institute for Educational Planning, Paris.

Bates, A. (1982). Trends in the Use of Audio-Visual Media in Distance Education Systems. In: *Learning at a Distance. A World Perspective* (J.S. Daniel, M. Stroud and J. Thompson, eds). Athabasca University and International Council for Correspondence Education, Edmonton.

Bates, A. (1985). New Media in Higher Education. (Papers on Information Technology No. 241), The Open University, Milton Keynes (ERIC Document Reproduction Service No. ED274 322).

Bates, A. (1988). Experiences from the British Open University and Pointers to the Future. Distansundervisning: En undervisningsform för 90-talet. Stockholm.

Bates, A. (1989). A Mid-way Report on the Evaluation of DT200. Institute of Educational Technology, The Open University. mimeo.

Beckwith, D. (1987). Group Problem-Solving via Computer Conferencing: The Realizable Potential. *Canadian Journal of Educational Communication*, **16**(2), pp 89-106.

Black, J.P., D.D. Cowan, V.A. Dyck, S.L. Fenton, C.K. Knapper, and T.M. Stepien (1988). Portable computers and distance education. In: *Developing Distance Education* (D. Sewart and J.S. Daniel, eds.). International Council for Distance Education, 14th World Conference, Oslo, 9-16 August, 1988.

Boyd, G. (1985). Providing for life-long affiliation with distance education institutions and the feasibility of doing so with personal communications. *Canadian Journal of Educational Communication*, **14**(1), pp 8-9.

Boyd, G. (1987). Emancipative Educational Technology. *Canadian Journal of Educational Communication*, **16**(2), pp 167-172.

Boyd, G. (1989). The Life-Worlds of Computer-Mediated Distance Education. In: *Mindweave, Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Brew, A. (1987). Independence in learning: towards community. *Open Learning*, 2(2), pp 52-55.

Brown, A. (1988). Zen and the Art of Course Maintenance. *Open D-bate*, 4. The Open University, Milton Keynes. mimeo.

Cadsby, C. (1985). Computer Conferencing and the Teaching of Economics: Application to a Small Advanced Class. Discussion Paper # 1985-8. Department of Economics, University of Guelph.

Caldwell, R., W. Van Nest, A. Tynan and R. Leach (1987). Conferencing Selection and Implementation: University of Arizona Case History. Proceedings of the Second Guelph Symposium on Computer Conferencing. University of Guelph, Ontario.

Carney, R. and W. Archer (1988). Distance Delivery to Northern Sites by Computer Conference. Paper presented at the Canadian Association for the Study of Adult Education, May 1988. Calgary, Alberta.

Castro, A. (1988). Critical reflections on the introduction of computer-mediated communication into a distance-teaching institution. The Open University, Milton Keynes. mimeo.

Castro, A. (1988b). Teaching and Learning as Communication: the Potentials and current applications of computer-mediated communication systems for Higher Level Education. In: *Higher Level Distance Education. Perspectives for International Cooperation and New Developments in Technology*. Unesco, Paris.

Clark, R. (1983). Reconsidering Research on Learning from Media. *Review of Educational Research*, **53**(4), pp 445-459.

Cohen, L. and L. Manion (1980). *Research Methods in Education*. Croom Helm, London.

Coombs, N. (1989). Using CMC to Overcome Physical Disabilities. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Cox, W.F. (1985). *Observations on Some Tele-education Trends and Developments*. Internal Report. Telecom Australia, Melbourne.

Daniel, J and C. Marquis (1979). Interaction and independence: getting the mixture right. *Teaching at a Distance*, **15**, pp 25-44.

Davie, L. (1989). Facilitation Techniques for the On-Line Tutor. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Davie, L. (1987). Learning Through Networks: A Graduate Course Using Computer Conferencing. *Canadian Journal of University Continuing Education*, **XIII**(2), pp 11-26.

Davies, D. (1989). Computer-Supported Cooperative Learning: Interactive Group Technologies and Distance Learning Systems. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye eds.). Pergamon, Oxford.

Dean, S. (1989). Possible Non-Teaching Uses of Home Computing. In: Home Computing in Practice 1988-1989, CITE Report No. 83, IET, The Open University.

Drake, M. (1979). The Curse of the Course Team. *Teaching at a Distance*, **16**, pp 50-53.

El-Bushra, J. (1973). *Correspondence Teaching at University*. International Extension College, Cambridge.

Electronic University Network (1987). *Catalog*. TeleLearning Inc., San Francisco.

Emms, J. and D. McConnell (1988). An evaluation of tutorial support provided by electronic mail and computer conferencing. In: *Aspects of Educational Technology XXI: Designing New Systems and Technologies for Learning*. Kogan Page, London.

Farnes, N. (1976). An Educational Technologist Looks at Student Centred Learning. *British Journal of Educational Technology*, **7**(1).

Feenberg, A. (1987). Computer Conferencing and the Humanities. *Instructional Science*, **16**, pp 169-186.

Feenberg, A. (1989). The Written World. In: *Mindweave, Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Feenberg, A. and B. Bellman (1989). Social Factor Research in Computer-mediated Communication. In: *Online Education: Perspectives on a New Medium* (L. Harasim ed.). Praeger/Greenwood Press Inc. in press.

First Report of the Steering Group for the Academic Review (1989). The Open University, Milton Keynes. mimeo.

Garrison, D.R. (1989). *Understanding Distance Education: a Framework for the Future*. Routledge, London.

Garrison, D.R. and D. Shale (1987). Mapping the Boundaries of Distance Education: Problems in Defining the Field. *The American Journal of Distance Education*, **1**(1), pp 7-13.

Garrison, D.R. and M. Baynton (1987). Beyond Independence in Distance Education: The Concept of Control. *The American Journal of Distance Education*, **1**(3), pp 3-15.

Goldberg, F. (1988). Telecommunications and the Classroom: Where We've Been and Where We Should Be Going. *Computing Teacher*, **15**(8), pp 26-30.

Goodyear, M. (1976). Open University Student Motivation. IET, The Open University, Milton Keynes. mimeo.

Gray, R. (1989). CMC for In-Service Training. In: *Mindweave, Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Guba, E.G. (1987). What Have We Learned About Naturalistic Evaluation? *Evaluation Practice*, 8(1), pp 23-43.

Guri-Rozenblit, S. (1988). The potential contribution of distance education for improving academic teaching in conventional universities. In: *Developing Distance Education* (D. Sewart and J.S. Daniel, eds.). International Council for Distance Education, 14th World Conference, Oslo, 9-16 August, 1988.

Hacker, K.L. *et al.* (1986). Organizational Culture and the Design of Computer-Mediated Communication Systems: Issues for Organizational Communication Research. Paper presented at the Annual Meeting of the Speech Communication Association (72nd, Chicago, OL, November 13-16, 1986).

Haile, P. (1986). An Analysis of Computer Conferences Supporting The Distance Learner. Paper presented at the Annual Conference of the American Educational Research Association (San Francisco, April 18, 1986).

Hall, J.W. (1987). Bridging the Technology-Pedagogy Gap. In: *Distance Education and the Mainstream* (P. Smith and M. Kelly, eds). Croom Helm, Australia.

Harasim, L and R. Wolfe (1988). Research Analysis and Evaluation of Computer Conferencing and Networking in Education: Final Report. Educational Evaluation Centre, The Ontario Institute for Studies in Education, Toronto.

Harasim, L. (1987). Computer-mediated cooperation in education: Group learning networks. *Proceedings of the Second Guelph Symposium on Computer Conferencing*. University of Guelph, Ontario.

Harasim, L. (1986). *Educational Applications of Computer Networks for Teachers/Trainers in Ontario*. Ontario Institute for Studies in Education, Toronto.

Harasim, L. (1989a). On-line Education: A New Domain. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Harasim, L. (ed) (1989b). *Online Education: Perspectives on a New Medium*. Praeger/Greenwood Press Inc. in press.

Harasim, L. and T. Winkelmans (1988). Computer-mediated scholarly collaboration: A case study of the 'International Online Educational Research Workshop'. Technical Paper #9. Ontario Institute for Studies in Education, Toronto.

Harry, K. (1982). The Open University, United Kingdom. In: *The Distance Teaching Universities* (G. Rumble and K. Harry, eds). Croom Helm, London.

Harry, K. and P. Raggatt (ed) (1984). *Trends in Distance Higher Education.* Open University Distance Education Research Group, Milton Keynes.

Hellerstein, L. (1986). Electronic Messaging and Conferencing with an Emphasis on Social Use: An Exploratory Study. Paper presented at the Annual Meeting of the International Communication Association (36th, Chicago, IL, May 22-26, 1986).

Henri, F. (1988). Distance education and computer-assisted communication. *Prospects*, **XVIII**(1), pp 85-90.

Henry, J. (1986). D309 Electronic Mail Evaluation. IET, The Open University, Milton Keynes. mimeo.

Heydinger, R. (1978). Computer Conferencing: Its Use as a Pedagogical Tool. Paper presented at the World Future Society Education Conference (Houston, TX, October 20. 1978).

Hiltz, S.R. (1987). Evaluating the Virtual Classroom: Revised and Updated Plan. CCCC Technical Report 87-1. Computerized Conferencing and Communications Center, New Jersey Institute of Technology.

Hiltz, S.R. (1984). *OnLine Communities: a case study of the office of the future.* Ablex, New Jersey.

Hiltz, S.R. (1988). *Learning in a Virtual Classroom. Final Evaluation Report.* Research Report 25. Computerized Conferencing and Communications Center, New Jersey Institute of Technology.

Hiltz. S. R. and M. Turoff (1978). *The Network Nation.* Addison-Wesley, Reading, Ma.

Hodgson, V.E., S.J. Mann, and R. Snell (1987). *Beyond Distance Teaching - Towards Open Learning.* The Society for Research into Higher Education and The Open University Press, Milton Keynes.

Holmberg, B. (1980). Aspects of Distance Education. *Comparative Education*, **16**(2), pp 107-119.

Holmberg, B. (1983). Organisational models for course development. *Epistolodidaktika* **2**, pp14-27.

Holmberg, B. (1988). Perspectives of research on distance education. Zentrales Institut fur Fernstudienforschung, Hagen.

Holmberg, B. (1989). Further to the question of whether distance education is a discipline. *Journal of Distance Education*, **IV**(1), p.62-64.

Holmes, M.E. (1987). A Conversational Analysis of Computer-Mediated Discourse. Paper presented at the Annual Meeting of the Speech Communication Association (73rd, Boston, MA, November 5-8, 1987).

Hosley, C. (1987). How to Get Reaction from Students in Big, Impersonal Lecture Classes. *Chronicle of Higher Education*, **33**(34), p 15.

Jarvis, P. (1981). The Open University Unit: Andragogy or Pedagogy? *Teaching at a Distance*, **20** pp 24-9.

Jevrons, F. (1987). Distance Education and Campus-Based Education: Parity of Esteem. In: *Distance Education and the Mainstream* (P. Smith and M. Kelly, eds). Croom Helm, Australia.

Johansen, R., R. DeGrasse and T. Wilson (1978). Group Communication Through Computers, Vol.5: Effects on Working Patterns. Institute for the Future, Menlo Park, CA.

Jones, A. and T. O'Shea (1982). Barriers to the use of computer-assisted learning. *British Journal of Educational Technology*, **13**(3), pp 207-217.

Kaye, A.R. (1985). Computer-mediated communication stystems for distance education: report of a study visit to North America. Institute of Educational Technology, Milton Keynes. mimeo.

Kaye, A.R. (1986). La Télématique comme outil de communication en formation à distance. *Le Bulletin de L'IDATE*, 23. Montpellier.

Kaye, A.R. (1987a). Introducing Computer-Mediated Communication into Distance Education. *Canadian Journal of Educational Communication*, **16**(2), pp 153-166.

Kaye, A.R. (1987b). Integrating Computer Conferencing into Distance Education Courses: A Discussion Paper. *The Second Guelph Symposium on Computer Conferencing*. University of Guelph, Ontario.

Kaye, A.R. (1988). Distance Education: the State of the Art. *Prospects*, **xviii**(1), pp 43-54.

Kaye, A.R. (1989). Computer-Mediated Communication and Distance Education. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Kaye, A.R. and G. Rumble (eds) (1981). *Distance Teaching for Higher and Adult Education*. Croom Helm, London.

Keegan, D. (1980). On Defining Distance Education. *Distance Education*, **1**(1), pp 13-36.

Keegan, D. (1986). *The Foundations of Distance Education*. Croom Helm, London.

Keegan, D. (1988). Problems in Defining the Field of Distance Education. *The American Journal of Distance Education*, **2**(2), pp 4-11.

Keegan, D. and G. Rumble (1982). Distance teaching at university level. In: *The Distance Teaching Universities* (G. Rumble and K. Harry eds.). Croom Helm, London.

Kerr, E.B. and S.R. Hiltz (1982). *Computer-Mediated Communication Systems: Status and Evaluation*. Academic Press, London.

Kiesler, S., J. Siegel, and T. McGuire (1984). Social psychological aspects of computer-mediated communication. Research Paper, Carnegie-Mellon University, Pittsburg, Pa.

Kiesler, S., D. Zubrow, A. Moses and V. Geller (1984). Affect in computer-mediated communication: An experiment in asynchronous terminal-to-terminal discussion. Research Paper, Carnegie-Mellon Unversity, Pittsburg, Pa.

Kinser, W. and J. Pear (1988). Computer-Aided Personalized System of Instruction for the Virtual Classroom. *Canadian Journal of Educational Communication*, **17**(1), pp 21-36.

Kirkwood, A. (1989). Evaluation of DT200. IET, The Open University. mimeo.

Laaser, W. (1988). Some obstacles to implement new information technologies in distance education. In: *Developing Distance Education* (D. Sewart and J.S. Daniel, eds.). International Council for Distance Education, 14th World Conference, Oslo, 9-16 August, 1988.

Laurillard, D. (1978). The Processes of Student Learning. 4th International Conference on Higher Education. University of Lancaster.

Lawless, C. (1989). Report on the Annual Survey of New Courses 1988. Report No. 25, IET, The Open University.

Lea, M. (1987). Review of Evaluation Methods. Cosmos Document 24:1. Department of Psychology, University of Manchester.

Levin, J., H. Kim and M. Riel (1988). Analysis of Instructional Electronic Message Interactions. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 6, 1988).

Levinson, P. (1986). Courses offered by Connected Education, Inc. In: The Virtual Classroom, Research Report 24. Computerized Conferencing and Communications Center, New Jersey Institute of Technology.

Levinson, P. (1989). Media Relations: Integrating Computer Telecommunications with Educational Media. In: *Mindweave, Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Lorentsen, A. (1989). Evaluation of Computer Conferencing in Open Learning. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

McGuire, T., S. Kiesler, J. Siegel (1986). Group and communication effects in risk choice. Research Paper, Carnegie-Mellon University, Pittsburg, Pa.

Markus, M.L. (1987). Toward a "Critical Mass" Theory of Interactive Media: Universal Access, Interdependence and Diffusion. *Communication Research: An International Quarterly,* **14**(5), p 491-511.

Marton, F. (1981). Phenomenography - Describing conceptions of the world around us. *Instructional Science*, **10**, p.177-200.

Mason, R. (1987). Computer conferencing: Its contribution to self-directed learning. *The Second Guelph Symposium on Computer Conferencing.* University of Guelph, Ontario.

Mason, R. (1988a). Computer conferencing: a contribution to self-directed learning. *British Journal of Educational Technology*, **19**(1), p 28-42.

Mason, R. (1988b). Computer conferencing and the university community. *Open Learning*, **3**(2), p 37-40.

Mason, R. (1989). An Evaluation of CoSy on an Open University Course. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds.). Pergamon, Oxford.

Mason, R. and A.R. Kaye (1989b). New Paradigms for Distance Education. In: *Online Education: Perspectives on a New Medium* (L. Harasim, ed.). Praeger/Greenwood Press Inc. in press.

Mason, R. and A.R. Kaye (eds) (1989a). *Mindweave: Communication, Computers and Distance Education*. Pergamon, Oxford.

Mason, R. with A. Morgan (1986). The Rough and the Smooth - Students' Experiences of OU Study. *Student Research Centre Report No. 2*. IET, The Open University, Milton Keynes.

McConnell, D. (1987). Use of the CoSy Computer Conferencing System as a Seminar Tool in the Educational Technology 2 Course at Bath University. Report prepared for the Computer Conferencing Group at the Open University. mimeo.

McCreary, E. and J. Van Duren (1986). Educational Applications of Computer Conferencing. Proceedings of the Association for Media and Technology in Canada. York University, Toronto.

McCreary, E. and J. Van Duren (1987). Educational Applications of Computer Conferencing. *Canadian Journal of Educational Communication*, **16**(2), pp 107-115.

McKenzie, O., R. Postgate and J. Scupham (1975). *Open Learning*. Unesco, Paris.

Merriam, S.B. (1988). *Case Study Research in Education. A Qualitative Approach*. Jossey-Bass, San Francisco.

Moore, G.A.B. (1987). The Introduction of Asynchronous Electronic Communication for Distance Education in Developing Countries: A Case Study in Thailand. Proceedings of the Second Guelph Symposium on Computer Conferencing, University of Guelph, Ontario.

Moore, M. (1973). Toward a Theory of Independent Learning and Teaching. *The Journal of Higher Education,* **XLIV**, 12, pp 661-679.

Moore, M. (1977). A Model of Independent Study. *Epistolodidaktika*, **1**, 6-40.

Morgan, A. (1987). Project work in open learning. In: *Open Learning for Adults* (M. Thorpe and D. Grugeon, eds). Longman Open Learning, Harlow, Essex.

Morgan, A., G. Gibbs and E. Taylor (1981). What do OU students initially understand about learning? *Study Methods Group Report* no. 8. IET, The Open University, Milton Keynes.

Murray, D.E. (1988). The context of oral and written language: A framework for mode and medium switching. *Lang. Soc.*, **17**, pp 351-373.

Muzio, J. (1989). Email and Electronic Transfer of Data Files for a Distance Education Course. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Neil, M. (1981). *Education of Adults at a Distance*. Kogan Page, London.

Nipper, S. (1989). Third Generation Distance Learning and Computer Conferencing. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Owen, T. (1989). Computer-Mediated Writing: the Writer in Electronic Residence. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Palme, J. (1981a). Experience with the Use of the COM Computerized Conferencing System. Draft report. Swedish National Defense Research Institute, Stockholm.

Palme, J. (1981b). Experience with the Use of the COM Computerized Conferencing System. Report C 10166E-M6(H9). Swedish National Defense Research Institute, Stockholm.

Parlett, M. and G. Dearden (eds.) (1977). *Introduction to Illuminative Evaluation: Studies in Higher Education.* Pacific Soundings Press, Cardiff-by-the-Sea, California.

Paulsen, M. (1989). EKKO: A Virtual School. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Paulsen, M. and T. Rekkedal (1988). Computer conferencing: a breakthrough in distance learning, or just another technological gadget? In: *Developing Distance Education* (D. Sewart and J.S. Daniel, eds.). International Council for Distance Education, 14th World Conference, Oslo, 9-16 August, 1988.

Perraton, H. (1981). A Theory for Distance Education. *Propects* **XI**(1), pp 13-24.

Perraton, H. (1987). Theories, generalisation and practice in distance education. *Open Learning,* **2**(3), pp 3-12.

Perry, W. (1976). *Open University.* Open University Press, Milton Keynes.

Perry, W. (1981). The growth of distance learning. In: *Education of Adults at a Distance* (M. Neil, ed). Kogan Page, London.

Peters, O. (1983). Distance Teaching and Industrial Production. A Comparative Interpretation in Outline. In: *Distance Education; International Perspectives* (D. Sewart D. Keegan and B. Holmberg, eds.).Croom Helm/St Martin's Press, London/New York.

Phillips, A.F. and P. Pease (1987). Computer Conferencing and Education: Complementary or Contradictory Concepts? *The American Journal of Distance Education,* **1**(2), pp 44-52.

Phillips, G., G. Santoro and S. Kuehn (1988). The Use of Computer-Mediated Communication in Training Students in Group Problem-Solving and Decision-Making Techniques. *The American Journal of Distance Education,* **2**(1), pp 38-51.

Quin, C., H. Mehan, J. Levin and S. Black (1983). Real Education in Non-Real Time: The Use of Electronic Message Systems for Instruction. *Instructional Science,* **11**, pp 313-327.

Rekkedal, T. (1985). Introducing the personal tutor/counsellor in the system of distance education. *Epistolodidaktika* 1985, **2**, pp 61-80.

Report of the Planning Committee (1969). The Open University, Milton Keynes.

Rice, R. (1984a). *The New Media: Communication, Research, and Technology.* Sage, Beverly Hills.

Rice, R. (1984b). Evaluating New Media Systems. In: *Evaluating the New Information Technologies* (J. Johnston, ed.). Jossey-Bass, San Francisco.

Rice, R. (1987). Computer-Mediated Communication and Organizational Innovation. *Journal of Communication* **37**(4), pp 65-85.

Richards, A. (1987). A Community of Learners: Computer Conferencing and Distance Education. Supplement to *Proceedings of the Second Guelph Symposium on Computer Conferencing*. University of Guelph, Ontario.

Riedl, R. (1989). Patterns in Computer-Mediated Discussions. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Roberts, L. (1988). Computer Conferencing: A Classroom for Distance Learning. *ICDE Bulletin*, **18**, pp 35-40.

Robinson, B. (1979). *Telephone Teaching: A Handbook for Tutors*. The Open University, Nottingham.

Robinson, B. (1981). Support for Student Learning. In: *Distance Teaching for Higher and Adult Education* (A.R. Kaye and G. Rumble, eds). Croom Helm, London.

Rogers, J. (1974). Accounting for themselves. In: The Open University Opens (J. Tunstall, ed). Routledge and Kegan Paul, London.

Rumble G. and K. Harry (eds) (1982). *The Distance Teaching Universities*. Croom Helm, London.

Rumble, G. (1982). *The Open University of the United Kingdom*. DERG Paper no. 6. The Open University, Milton Keynes.

Rumble, G. (1986). *The Planning and Management of Distance Education*. Croom Helm, London.

Rumble, G. (1988). The economics of mass distance education. *Prospects*, **18**(1), pp 91-102.

Rumble, G. (1989a). On-Line Costs: Interactivity at a Price. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Rumble, G. (1989b). Interactivity, independence and cost. Proceedings of the ICDE and OU conference: Interaction and Independence, Cambridge, England.

Saunders, C. and J. Heyl (1988). Evaluating Educational Computer Conferencing. *Journal of Systems Management*, April, pp 33-7.

Scollon, S. (1981). The Teacher-Student role in Instructional Telecommunications. Paper presented at the Annual Meetings of the American Anthropological Association (Los Angeles, CA, December, 1981).

Sewart, D. (1978). *Continuity of concern for students in a system of learning at a distance*. FeU (ZIFF), Hagen.

Sewart, D. (1981). Distance teaching: a contradiction in terms? *Teaching at a Distance*, **19**, pp 8-18.

Sewart, D. (1987). Limitations of the learning package. In: *Open Learning for Adults* (M. Thorpe and D. Grugeon, eds). Longman Open Learning, Harlow, Essex.

Sewart, D., D. Keegan and B. Holmberg (eds.) (1983). *Distance Education; International Perspectives*. Croom Helm/St Martin's Press, London/New York.

Shale, D. (1987). Innovation in International Higher Education: The Open Universities. *Journal of Distance Education*, **2**(1), pp 7-24.

Smith, J.K. (1983). Quantitative Versus Qualitative Research: An Attempt to Clarify the Issue. *Educational Researcher*, **12**(3), pp 6-13.

Smith, J.K. and L. Heshusius (1986). Closing Down the Conversation: The End of the Quantitative-Qualitative Debate Among Educational Inquirers. *Educational Researcher*, **15**(1), pp 4-12.

Smith, P. (1987). Distance Education and Educational Change. In: *Distance Education and the Mainstream* (P. Smith and M. Kelly eds.). Croom Helm, Australia.

Smith, P., and M. Kelly (eds.) (1987). *Distance Education and the Mainstream*. Croom Helm, Australia.

SUNY, Empire State College (1985). A Report on the Electronic University of the Future: A Planning Colloquy, May 16-17, 1985. New York.

Taylor, E and A.R. Kaye (1986). Andragogy by Design? Control and Self-Direction in the Design of an Open University Course. *PLET*, **23**(1), pp 62-69.

Taylor, E., A. Morgan, and G. Gibbs (1981). The 'Orientation' of Open University Foundation Students to their Studies. *Teaching at a Distance*, **20**, pp 3-12.

Taylor, R., J. Mohammad, T. Rubin and T. Roberts (1987). COSMOS User Interface Team End of Year Report. British Telecom Research Laboratories, Martlesham Heath, Ipswich.

Thomas, R. (1989). The Implications of Electronic Communication for the Open University. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

Thorpe, M. (1989). The Tutor Perspective on CMC in DT200. The Open University, Milton Keynes. mimeo.

Thorpe, M. and D. Grugeon (eds) (1987). *Open Learning for Adults*. Longman Open Learning, Harlow, Essex.

Tight, M. (1988). Defining Distance Education. *ICDE Bulletin*, **18**(September), pp 56-60.

Tunstall, J.(ed) (1974). *The Open University Opens*. Routledge and Kegan Paul, London.

Turoff, M. (1987). CMC: Possibilities and Potential. Keynote Address. The Second Guelph Symposium on Computer Conferencing (June 1-4, 1987). University of Guelph, Ontario.

Turoff, M. (1989). Computer Mediated Communication Requirements for Group Support. Invited paper for Conference on Organizational Computing, Coordination and Collaboration Theories and Technologies for Computer Supported Work, University of Texas, Austin, November 13-14, 1989.

Upton, E. (1987). Computer Conferencing: A Tool for Hospitality Professionals. *Proceedings of the Second Guelph Symposium on Computer Conferencing*. University of Guelph, Ontario.

Utsumi, T., P. Rossman and S. Rosen (1988). The Global Electronic University. *The American Journal of Distance Education*, **2**(2), pp 57-67.

Vallee, J. R. Johansen, H. Lupinski, K. Spangler and T. Wilson (1975). Group Communication Through Computers, Vol.3: Pragmatics and Dynamics. Institute for the Future, Menlo Park, CA.

Vallee, J., R. Johansen, H. Lipinski and T. Wilson (1978). Group Communication Through Computers, Vol.4: Social, Managerial, and Economic Issues. Institute for the Future, Menlo Park, CA.

Vallee, J., R. Johansen, R. Randolph and A. Hastings (1974). Group Communication Through Computers: Vol.2, A Study of Social Effects. Institute for the Future, Menlo Park, CA.

Van Duren, J. (1989). CMC at Athabasca University. In: *Mindweave: Communication, Computers and Distance Education* (R. Mason and A.R. Kaye, eds). Pergamon, Oxford.

van der Eyken, W. (1974). The seeds of radical change. In: *The Open University Opens* (J. Tunstall, ed). Routledge and Kegan Paul, London.

Walker, R. (1980). The Conduct of Education Case Studies: Ethics, Theory and Procedures. In: *Rethinking Educational Research* (W.B. Dockrell and D. Hamilton, eds.). Hodder and Stoughton, Sevenoaks, Kent.

Webb, E., D. Campbell, R. Schwartz, L. Sechrest and J. Grove (1981). *Nonreactive Research in the Social Sciences.* Houghton-Mifflin, Palo Alto, California.

Wedemeyer, C. (1971). Independent Study. In: *The Encyclopaedia of Education* (L. Deighton, ed), 4, 5448-5557. Macmillan, New York.

Welford, R. (1988). DT200 and Computer Mediated Communications. *Open D-bate*, **4**, p.5. mimeo.

Wenger, M. (1987). The Role of Interactive Technology in Education. *Educational Media International*, 24(1), pp 7-10.

Wiersma, W. (1969). *Research Methods in Education: an introduction.* J.B.Lippincott Co, Philadelphia/New York.

Woodley, A. (1988). Graduation and beyond. *Open Learning*, **3**(1), pp 13-17.

Zuboff, S. (1988). *In the Age of the Smart Machine.* Basic Books, New York.

CENTRE FOR INFORMATION TECHNOLOGY IN EDUCATION

List of CITE Ph.D. Theses

Thesis No.	Title and Author
1	Jenny Preece, (March 1985) Interpreting Trends in Graphs: A Study of 14 and 15 Year Olds. (Available from Open University library)
2	Tony Priest, (October 1986) Modelling Student Errors in Physics Problem-Solving. (Available as CAL Technical Report No. 68)
3	Alistair Edwards, (July 1987) Adapting user interfaces for visually disabled users. (In press by Paul Chapman's Publishers)
4	Simon Holland, (July 1989) Artificial Intelligence, Education and Music. The use of Artificial Intelligence to encourage and facilitate music composition by novices. (Available as CITE Report No. 88)
5	Pat Fung, (October 1989) An Application of Formal Semantics to Student Modelling: an investigation in the domain of teaching Prolog.
6	Robin Mason (December 1989) A Case Study of the Use of Computer Conferencing at the Open University.